

ARMS CONTROL: BURDEN OF CHANGE



Edited by **Dr. Viatcheslav Kantor**
President of the International Luxembourg Forum
on Preventing Nuclear Catastrophe

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**International Luxembourg Forum
on Preventing Nuclear Catastrophe**

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This book arises from the 2019 Conference of the International Luxembourg Forum on Preventing Nuclear Catastrophe, which was held in Rome, Italy, June 4-5, 2019. The Conference gathered world-renowned experts in nuclear security, arms reductions and nuclear non-proliferation from the United States, Russia and other countries to discuss international and regional issues of common concern. It is a collection of contributions, comprising a variety of topics that were covered during the Conference, including the crisis of nuclear arms control, the future of the Treaty on the Non-Proliferation of Nuclear Weapons, and the ways to prevent nuclear terrorism.

The official website of the International Luxembourg Forum: www.luxembourgforum.org

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INTRODUCTION BY VIATCHESLAV KANTOR, PRESIDENT OF INTERNATIONAL LUXEMBOURG FORUM

Area of activities of the International Luxembourg Forum on Preventing Nuclear Catastrophe, which is, in broad terms – supporting nuclear arms control and strengthening non-proliferation – is currently immersed in multiple crises. Most importantly, among those who are personally involved in addressing these crises is the majority of the Forum's recently expanded Supervisory Board members and the heads of the six leading international organizations engaged in studying nuclear arms control and reduction, strategic and regional stability, as well as the issue of nuclear terrorism.

The need for a way to stop the erosion of the principles of strategic stability has reached a point where nearly all research centers, institutes and relevant organizations have set up think tanks and put forward solutions for overcoming the nuclear arms control crisis. Most of these proposals are similar in nature – coming up with any new solution in this area is quite difficult.

The causes of this crisis are well known. They include the imminent scrapping of the Intermediate-Range Nuclear Forces Treaty (INF), the uncertain prospects for extension of the New Strategic Arms Reduction Treaty, the insufficient progress towards denuclearization of the Korean Peninsula, the US withdrawal from the nuclear deal with Iran – who has already announced that it would resume uranium

enrichment – and other factors related to the heightened tensions among the United States, the European Union and Russia.

With regard to the situation at hand, one prominent Russian intellectual said that we were standing on an escalator that just kept going down and in order to avoid ending up at the bottom we had to keep running upwards. We could not reach the top again but we should at least try to stop descending. The Forum's analysts are always looking for ways to make progress back towards the top. So what could we do to achieve that?

The US leadership is advancing the idea of expanding the nuclear arms reduction treaties' framework by bringing others, above all China, into the negotiations. Is it possible to make any progress in this regard?

We have examined several scenarios of the possible consequences of the INF Treaty's collapse, from relatively mild – deployment of non-nuclear cruise missiles only within NATO countries and in Russia – to full-scale deployment of nuclear-armed cruise and ballistic missiles.

I believe that steps can be taken to delay the unfolding of any of these scenarios, in particular those of them that involve nuclear weapons deployment. President Trump proposed replacing the INF Treaty with a new, multilateral agreement. This was something President Putin had spoken about on a number of earlier occasions. Leaders, who get the ideas for such proposals from their advisors, usually have little understanding of the content of such treaties, and especially of the detailed verification systems, which would be virtually impossible to implement in multilateral format. Furthermore, expecting that China, or other nuclear states, would agree to give up their intermediate-range missiles is completely unrealistic. Nevertheless, ignorance can sometimes be put to good use, because these kinds of talks can last for years, and historical experience shows that the parties respect proposed limitations so long as the talks continue. At best, this negotiating process could produce some kind of agreement on transparency and preserving current limits on nuclear weapons stockpiles.

As far as we can work out, talks are underway on extending the New START Treaty by another five years. We are cautiously optimistic about it. The United States would benefit from the positive outcome of these talks because it would continue to have exhaustive information on Russia's strategic offensive weapons, while Russia would benefit in terms of maintaining the strategic offensive weapons' balance with the United States and also save money.

If the Treaty is extended, we can hope that the parties will be able to reach agreement on preserving the principles of strategic stability and a follow-on START Treaty will be drafted. If this indeed happens, President Trump will certainly like to include China in it too but it seems unlikely that China will go for it. It would make sense to focus first on drafting a new treaty between the United States and Russia and then examining possibilities for getting China engaged in one form or another.

It is also important to address the topic of persistent and evolving threat of nuclear terrorism. At the turn of the XXI century, it drew attention of both governmental and non-governmental experts to the risk of nuclear materials and even nuclear arms falling into the hands of terrorists. Numerous studies have been conducted to assess this threat and look at ways to fight them. A whole range of measures has been taken at the national, multilateral and global levels to prevent the threat of nuclear terrorism. However, in spite of a sufficient level of international cooperation that has been achieved in this area, the threat remains as real as ever.

In the past, I quoted the prophetic words of former Assistant Secretary of Defense Graham Allison, who said that we should be talking “not about whether terrorists will be able to carry out a catastrophic nuclear terrorist attack, but about when they will do so.”

The likely scenarios by which terrorists could acquire and use nuclear materials have been studied in depth. We have discussed them on many occasions at Forum's conferences and have proposed various solutions for making prevention measures more effective. They include

establishing a global international system to control movements of radioactive materials using universal hardware and software systems that can detect illicit movements of these materials. As far as we know, the United States and Russia have already developed prototypes for such control systems but these systems would need to be integrated on the basis of commonly agreed principles. I believe that it is something we should continue reminding the leaders of major powers about.

We could also discuss deeper integration of counterterrorism agencies and services. We could, for example, establish an international coordination center or headquarters in Europe, where representatives of relevant ministries and intelligence services of the major powers could work together on a permanent basis. This would take coordination to a new level and enable quick operational decision-making and the use of rapid response forces.

Implementing our proposals also contributes to the goal of ensuring the success of the 2020 Review Conference of the Nuclear Non-Proliferation Treaty.

At a time when the principles of strategic stability face continued erosion, implementation of these proposals would pave the way to a new stage in efforts to prevent the collapse of nuclear arms control regime. We could borrow the words of Winston Churchill, who, following the allied victory in North Africa, said, “Now this is not the end. It is not even the beginning of the end. But it is, perhaps, the end of the beginning.”

I believe that the unprecedented intellectual potential that our cooperation within the Luxembourg Forum brings together is capable of achieving a breakthrough for prevention of nuclear catastrophe. As is sometimes said, “If we don’t act, who will?”

THE NEW ABNORMAL

*William Perry*¹

Earlier this year, the Bulletin of the Atomic Scientists made their annual determination on the level of danger of a nuclear conflict; a conflict that could end our civilization. They quantified that danger by setting a clock. On that clock midnight is the end of our civilization; and they estimate how close the world is to that catastrophe.

This year they set the clock at two minutes to midnight, closer than any year of the Cold War except 1954, one of the darkest years of the Cold War, when it was set at the same level. But this was the second year in a row at that level. Rachel Bronson, president of the Bulletin, called it the *new abnormal*. In one sense it is *normal*, since Americans and Russians seem to have accepted it. But in a more important sense, it is *abnormal* since it reflects such a dangerous condition.

How has the world gotten to this state of mind? Why does one consider such a grim warning as *normal*? Let us first consider what is happening to arms control treaties.

From 1969 to 2016, almost 50 years, every administration in the United States and the Soviet Union (later Russia) sought to limit the cost and danger of the nuclear arms race through bilateral treaties.

¹ William Perry – Professor at the Stanford University; Member of the Supervisory Board of the International Luxembourg Forum (former US Secretary of Defense); Ph.D. (USA).

This resulted in a series of treaties from Strategic Arms Limitation Talks (SALT) in 1972 to New Strategic Arms Reduction Treaty (START) in 2016. In the United States these treaties were pursued by Republican and Democratic administrations, although Democratic administrations had a harder time getting their treaties ratified in the Senate. Even so, both parties considered it *normal* and wise to seek to control nuclear weapons through bilateral treaties.

But there has been a dramatic change in how treaties are considered in the United States. For the Trump administration the new normal is to *not* negotiate any new treaties and *systematically withdraw* from the treaties that existed when they took office. And, in the last two years, they have been remarkably successful in doing so. The most significant action has been their decision to withdraw from the INF treaty. It is noteworthy that the prime mover behind this withdrawal has been the President's National Security Advisor, John Bolton, who was also the prime mover behind the US withdrawal from the ABM Treaty, almost 20 years ago.

The Anti-Ballistic Missile (ABM) Treaty was a treaty of fundamental importance in that it made it possible to limit the numbers of inter-continental ballistic missiles (ICBMs), and it is now gone.

The INF treaty was probably the most significant arms control treaty ever negotiated, in that it eliminated a whole class of missiles, the intermediate-range missiles, thereby removing a dangerous threat to all of Europe, including European Russia.

On top of that, it appears that the Trump administration intends to let New START expire in 2020, rather than extend it, or negotiate a follow-on treaty. If that happens, there will be, for the first time in almost 50 years, no agreed limit on nuclear weapons, and there will be no bilateral talks on how to limit nuclear dangers. This has become the new *normal* for arms control treaties, which I call the new *abnormal*, and it has happened in just two years.

This new abnormal is also happening in another major field: minister-to-minister dialogue.

*For many decades of geopolitical disagreements between the United States and the Soviet Union, later Russia, those disagreements have been the subject of intense bilateral talks between our ministers of foreign affairs and ministers of defense. This was the *normal* way our two countries worked to minimize the existential dangers of nuclear weapons. The talks were not always successful, but they were always conducted with the understanding that the nuclear dangers were so profound between our two countries that we could not let our geopolitical disagreements erupt into military conflict.*

The new *abnormal* is to *not* have a regular dialogue to deal with geopolitical disagreements. Trump and Putin have had two summits, with no real public understanding about what they discussed, but there has been no systemic engagement of our Foreign Ministers or Defense Ministers. To put this in perspective, by the time I had been Defense Secretary of the United States for 2 years I had met with the Defense Minister of Russia five times, and during those meetings we had reached agreements on matters of great significance: we agreed on a course of action to dismantle 4,000 nuclear weapons in 3 former Soviet republics; and we agreed on a plan by which US and Russian troops would operate together in Bosnia.

And through this dialogue, we reached a level of understanding and trust so that if any new security issue arose, we could discuss it one on one before it got out of hand. This I considered a normal and appropriate way of dealing with national security issues between our two countries.

But that normal way of dealing with security issues has been replaced with a new *abnormal* that does not include these important bilateral meetings at the minister level. And yet there is no public discussion to highlight that this dialogue is not happening. The normal we had established of a close working relationship between ministers led to a good understanding between them, so that when geopolitical issues arose, the ministers could discuss them from a position of mutual trust, allowing them to iron out these issues before they became a problem. Thus it was unlikely that a misunderstanding could lead to a military conflict.

That was the new *normal* that we developed when the Cold War ended. It was of critical importance to our two countries, because it gave us an opportunity to work out misunderstandings before they resulted in a political miscalculation that could lead to a dangerous military response.

Today we have the new *abnormal* of no meaningful communications, and therefore no trust or understanding that could lead to a resolution of misunderstandings before they lead to political miscalculations.

I am convinced that the only way our two countries could have a military conflict is through a political miscalculation; that is, through a blunder. But history is replete with military conflicts arising from blunders. And today a blunder that results in a military conflict runs the risk of having that conflict escalate to a nuclear conflict. So *the new abnormal* of no trust or understanding at the defense minister and foreign minister levels carries with it a very high potential price.

Additionally, we have a new *abnormal* in track 2 dialogues. During the Cold War, and the first two decades after the Cold War, it was *normal* to have a robust program of Track 2 meetings between non-government employees of the United States and the Soviet Union. I was deeply engaged in several different Track 2 dialogues with my counterparts from the Soviet Union, and that is also true of many others. We had no official function, but we did have close rapport with the officials in our government, and we were often able to work through a problem without the encumbrance of having to support an official position; then carry the solution we arrived at to our government counterparts, to everyone's benefit. That was very helpful, and it was normal and accepted.

The new *abnormal* is to not have Track 2 meetings, perhaps because people fear that their government will consider that people who attend such meetings are somehow disloyal. As a consequence, the Luxembourg Forum is the only remaining Track 2 of significance that holds consistent meetings to consider ways of avoiding a nuclear conflict. For that reason, this Forum is of unique importance, and we

should all feel the responsibility of supporting it, and do our best to give thoughtful and well-informed advice to our two governments.

I should mention that there is a youth organization that has been conducting unconventional Track 2 discussions the past few years.

It is called SURF, which stands for Stanford University US-Russian Forum, and it brings together students from Russian colleges and American colleges. They meet twice a year; once at Stanford, and once in Russia. This year their US meeting will be held in conjunction with the Fort Ross Conservancy, which has been operating for many years to commemorate and support the US-Russian interest in Fort Ross, California.²

This year, SURF is going to add to their agenda a Track 2 dialogue on nuclear issues, chaired by the former governor of California, Jerry Brown. It will be interesting to see if this new dialogue can develop into a new significant voice in reducing nuclear dangers. So SURF is deviating from the new abnormal in Track 2. They are trying to *start* a new Track 2 dialogue devoted to lowering nuclear dangers between our two countries.

The participants are not deterred by the possible concern of how their governments might feel about Track 2 activities. The students are too *young* to care about such concerns; Gov. Brown and I are too *old* to care about such concerns! And we are hoping that we will get a strong attendance at this meeting of influential Russians and Americans.

So there is definitely a new abnormal in these important areas, especially those relating to nuclear dangers. To some extent, it can be laid at the feet of our two leaders, and the unusual relationship they have developed. But at a more fundamental level, it is attributable to the mindsets of many Russians and many Americans, who formerly participated in a robust bilateral dialogue but have chosen to not participate today. That is, they have chosen to accept the new abnormal as normal, even appropriate.

² Fort Ross is a former Russian base in Northern California that was built before the Russian Tsar sold Alaska and California to the United States.

BURDEN OF CHANGE: TIME FOR NEW THINKING

Joan Rohlfig¹

There is a growing sense of crisis within the nuclear security field and for good reason: after five decades of regulation and reductions of the most dangerous weapons on earth, the nuclear weapons states have resumed an arms race. As Dr. William Perry says, this is part of the “new abnormal.” The carefully constructed, multi-generational architecture for limiting nuclear weapons is being dismantled without a replacement plan, while the risk of nuclear use grows significantly.

There are many reasons for the current state of events, and political responsibility can be shared on all sides for our failings. But the challenge of the current moment is a result of more than just politics. It also represents a collective failure of leadership and intellectual rigor among the expert community. Our ability to achieve significant progress in reducing and eliminating nuclear threats is limited by a strict adherence to ways of thinking about nuclear risks that are now outdated by technology and world events.

¹ Joan Rohlfig – President and Chief Operating Officer, Nuclear Threat Initiative; Member of the Threat Reduction Advisory Committee of the US Department of Defense; Member of the Council on Foreign Relations (former Senior Advisor for National Security to the US Secretary of Energy) (USA).

New risks and dangers

A growing number of experts, especially younger experts, have described the nuclear field as a stuck field, with frozen thinking.

It is being operated from a strategy, doctrine and force planning that have remained essentially unchanged for 60 years, despite the evolution of a fundamentally different threat environment. Some sixty years ago, when the theory of nuclear deterrence became the central organizing tenet for designing our forces and force posture plans, we had only half the nuclear weapon states of today, and a force based primarily on slow-flying strategic bombers. The United States and Russia were primarily focused on preventing the intentional use of a nuclear weapon against each other. Nuclear terrorism was not considered conceivable at that point. And the computational power and cyber capabilities that now resident in a laptop computer were not imaginable in 1960.

Our thinking about the requirements for maintaining the so-called “Delicate Balance of Terror” was shaped by early intellectual contributors like Albert Wohlstetter and Bernard Brodie and quickly became deeply entrenched in the thinking of the expert community both within and outside of government. We convinced ourselves that a credible deterrent could be maintained only through the redundancy of a triad of forces in significant numbers, a willingness to use nuclear weapons first if need be, and a force in “ready-to-fire” mode to dissuade rational leaders from trying to strike first.

Today, we are still primarily focused on preventing the risk of intentional use, using the same script and logic from 1960. How many other fields can we say this of: 60 years of the same way of thinking about an issue even though the threat and technology environments have changed dramatically?

Why is this a problem?

Why is relying on outdated security strategies a problem? Because the world has changed significantly.

Today, the risk of use is not primarily driven by the failure to deter

the intentional use of nuclear weapons. Today, the primary threat we should be focused on is the risk of *unintended* and *un-deterrable* nuclear use. As we design the forces, policies, and practices of the future, we should be focusing on reducing the risks and consequences of use from faulty or false information, either from cyber-attacks or equipment malfunction. We should work to reduce the chances of misinterpretation of events or information leading to a leader's erroneous decision to launch, perhaps exacerbated by a sophisticated spoof against our forces, or a "deep fake" on social media. The technologies to spoof and create deep fakes, combined with the current environment of strategic competition between the United States and Russia, the absence of ongoing channels of communication, and an overall toxic relationship all greatly increase the risk of blundering into nuclear use through the escalation of mistakes during a crisis. We also must continue to focus and cooperate on preventing nuclear terrorism, against which deterrence is largely irrelevant.

In fact, nuclear deterrence was not designed to address any of these new threat vectors. Worse, our current practices for sustaining nuclear deterrence escalate both the risks and the consequences of a catastrophic accident, miscalculation, or blunder. Yet the strategy of nuclear deterrence continues to be used as the primary driving rationale for declaratory policy, force structure, and force posture. This primacy assigned to maintaining nuclear deterrence – to preventing intentional use of nuclear weapons by a state – compounds the very nuclear dangers they were designed to address.

Specifically, nuclear deterrence, in its current form, has been used to:

- justify the need to reserve the right of first use;
- maintain a triad of forces;
- posture forces on prompt launch; and
- maintain sufficient numbers of nuclear weapons to assure that a sustained nuclear war could be prosecuted.

Against this backdrop we are moving toward nuclear *de*-regulation – an unrestrained strategic competition, new and more dangerous

kinds of nuclear systems in Russia, expanded missile defense by the United States, all of which intersect with new and more dangerous technologies, such as cyber, artificial intelligence, and hypersonic systems. In sum, we are at a highly dangerous moment – and moving in the wrong direction.

Hard questions

It is worth considering why we have been unable to move toward more effective nuclear risk reduction and a safer form of deterrence. We must consider a number of hard questions and think critically about how to construct a safer nuclear strategy, one that is more responsive to today's undeterrable nuclear risks.

- Why do we still need thousands of weapons whose primary purpose is to never be used? Surely deterrence can be credible at much lower levels of weapons.
- How did we decide to give our leaders only 7-10 minutes to make the most consequential decision ever made by any leader on earth and why do both leaders and citizens tolerate that?
- Can't we devise a survivable system that does not require this prompt-launch posturing?
- Why have we delegated the authority to use nuclear weapons to a single person in each of the countries that have them? We require our scientists to make our weapons "one-point" safe so that they do not accidentally detonate if they are dropped or shot at. But we have engineered a single point of failure for decision-making. Is that rational?
- Why do our citizens tolerate living with the terror of sudden and indiscriminate nuclear annihilation?
- And given all that uncertainty, how can we possibly say we have personal and national security today?

Surely, we can invent a system that is more responsive to today's threats, decreases the risk of use, and reduces the consequences of a nuclear catastrophe if, in fact, a detonation occurs.

The burden of change: time for new thinking

It's time for a fundamental rethinking of doctrines, strategies, practices, and belief systems about nuclear weapons. We need a new approach to nuclear threats that is designed to fit today's world. We need to systematically explore alternatives to the *status quo*.

As if this grim backdrop was not enough of a challenge, we also have a second, parallel crisis – a capacity gap. There is currently a deeply diminished human capacity to manage the challenges of the current nuclear era. Unlike at the height of the Cold War, when the best and the brightest were dedicating their lives to managing the nuclear threat, today, the US government has lost much of its deep expertise, due to retirements, forced departures, and a hollowing out of a mid-career cohort. Outside of government, there is a palpable sense of crisis, due to the lack of a clear career path for those interested in entering the field. Just as the institutional memory of long-time career officials is either retiring or dying, our field's early career cohort is opting out from frustration and despair.

This capacity crisis has three different dimensions related to age, gender, and diversity. Why should we care? Because without a new generation of experts and a diversity of perspectives dedicated to problem solving, we are much less likely to unstick our stuck problem, and we are less likely to successfully prevent a nuclear crisis or manage one, if it occurs.

What can we do?

We, the community of experts around this table, all must encourage new thinking. We must together lead the movement to challenge old paradigms to create a safer nuclear future. We also must work to support diversity of thought and diversity of voices within the expert community – to make a conscious effort to invest in developing the next generation of nuclear experts and leaders.

I

MAINTAINING ARMS CONTROL IN THE ABSENCE OF THE INTERMEDIATE-RANGE NUCLEAR FORCES TREATY

1.1. THE CRISIS OF THE US-RUSSIAN ARMS CONTROL: THE INF TREATY, THE NEW START, AND BEYOND

Daryl Kimball¹

More than a quarter century since the end of the Cold War, the United States and Russia are in a qualitative nuclear arms race.

There have been no serious disarmament negotiations since the conclusion of the 2010 New START and Moscow's rejection of a 2013 Obama administration offer to begin talks on a follow-on treaty.

Since then, tensions between Washington and Moscow and between Washington and Beijing have continued to worsen. With the arrive of the Trump administration, official US support for arms control approaches that have helped to manage US-Russian nuclear relations and reduce nuclear risks are in jeopardy

President Trump and his National Security Advisor John Bolton have shunned a proposal supported by his own Defense and State departments to engage in strategic stability talks with Moscow. Trump also has ordered the termination of the 1987 Intermediate-Range Nuclear Forces Treaty in response to Russian violations of the treaty without a viable plan B. There are no talks underway to resolve the dispute, and it is all but certain the United States will withdraw from the Treaty on August 2.

¹ Daryl Kimball – Executive Director, Arms Control Association; Chief Editorial Advisor of Arms Control Today (former Executive Director of the Coalition to Reduce Nuclear Dangers; Director of Security Programs at the Physicians for Social Responsibility) (USA).

Trump's national security team has dithered for more than a year on beginning talks with Russia to extend the 2010 New START before it expires in February 2021.

Complicating matters, Donald Trump has directed his administration to seek a new arms control agreement with Russia and China that should include: "all the weapons, all the warheads, and all the missiles," including nuclear and missile systems not covered by New START.

Bringing other nuclear actors and all types of nuclear weapons into the disarmament process is, of course, an important and praiseworthy objective. But this administration has no plan, strategy, or capacity to negotiate such a far-reaching deal. China is, for now, not interested. Russia has its own concerns about certain US capabilities. Any such effort will be complex and time consuming.

It is possible, if not likely, that Trump and Bolton are scheming to walk away from New START by setting conditions they know to be too difficult to achieve.

In light of these developments, is there a future for nuclear arms control? Yes, of course, there is but the road ahead is rocky, the route is twisted, and those now leading the way do not seem to know where they are going.

The likely termination of the INF Treaty on August 2 does not, by itself doom New START, but some of the same factors that brought down that treaty could also spell the end of New START.

Whether New START is extended or not, new weapons capabilities under development – hypersonic vehicles, an expanded US missile defense architecture, offensive cyber capabilities designed to attack nuclear command and control systems, and new cruise missiles – create new challenges that will complicate the next phases of bilateral and multilateral nuclear disarmament diplomacy.

The following is a brief analysis of these challenges and recommendations for moving forward in ways to maintain stability, reduce nuclear risks, and eliminate nuclear excess.

The INF Treaty

New thinking and new talks on post-INF new arms control arrangements will be needed to avert a dangerous and costly new missile race in Europe.

On February 2, both sides announced that they will suspend their obligations under the three-decade-old Treaty and the United States will likely withdraw on August 2. This will scuttle the agreement that led to the verifiable elimination of 2,692 Soviet and US missiles, helped end the Cold War, and paved the way to slash bloated strategic nuclear arsenals. Already, each side is accelerating their pursuit of new intermediate-range, ground-based missiles in Europe and beyond.

Russia has already deployed three battalions of its INF-noncompliant 9M729 ground-launched cruise missiles, very likely armed with conventional warheads, and could soon deploy more.

The Kremlin said it would modify the naval Kalibr cruise missile for use by ground forces by next year. Russia's under-development RS-26 ICBM could also be modified to fly at intermediate ranges.

Trump administration officials claim they do not have any plans right now for the deployment of *nuclear* missiles in Europe, but they clearly do intend to try to deploy conventional, ground-launched, intermediate-range missile systems in Europe.

As reported in May in *Arms Control Today*, the Defense Department budget has requested \$100 million in additional funding for research and development on three INF-noncompliant systems, including a variant of the Navy's Tomahawk sea-based cruise missile and an intermediate-range version of the short-range Army Tactical Missile System. These could be flight-tested later this year. The cruise missile could be deployed next year.

As reported in the June issue of *Arms Control Today*, NATO Defense Ministers will meet June 26 to prepare defense and deterrence measures "to ensure the security of the alliance."

Russia would see any deployment of such missiles, whether with conventional or nuclear warheads, as a direct threat to its leadership

and command-and-control centers — and NATO’s eastward expansion allows these weapons to be placed on the Russian doorstep. Russia will respond in kind.

If both sides begin to deploy intermediate-range ballistic missiles and ground-launched cruise missiles, Europe will be less secure and the risk of a military incident or miscommunication leading to a full-scale war with Russia will increase.

Unfortunately, neither the Trump administration, nor NATO, have put forward a realistic plan to block the Russians from just such a build-up. Instead, President Donald Trump, along with NATO Secretary-General Jens Stoltenberg, have been issuing vague statements expressing an openness to expanding the INF Treaty to China and other states that possess intermediate-range missiles.

While efforts to engage China in a broader nuclear risk reduction and disarmament dialogue are useful, achieving progress of any kind is long-term proposition, and the INF Treaty – which was specifically designed to deal with US-Soviet missiles in Europe – is not the right template. This idea gained no traction when Washington and Moscow formally proposed it in 2007; there is no chance Beijing would sign on today.

Joining the INF Treaty would mean that China would have to eliminate 95% of its missile arsenal, while leaving intact the formidable US air- and sea-based strike forces and sea-based missile interceptors. Beijing is not going to agree to what it would consider to be unilateral disarmament.

A new post-INF strategy

With the INF Treaty’s days numbered, a new and more serious arms control initiative is needed – and soon.

One option would be for NATO to declare, as a bloc, that no alliance members will field any INF Treaty-prohibited missiles or any equivalent new nuclear capabilities in Europe so long as Russia does not deploy treaty-prohibited systems where they could hit NATO

territory. This would require Russia to move at least some currently deployed 9M729 missiles. As the United States and Russia dispute the range of that missile; perhaps they could agree to bar deployments west of the Ural mountains.

The US and Russian presidents could agree to this “no-first INF missile deployment plan” through an executive agreement that would be verified through national technical means of intelligence and monitoring mechanisms available through the Open Skies Treaty and Vienna Document.

Russia could be expected to insist upon additional confidence-building measures to ensure that the United States would not place offensive missiles in the Mk 41 missile-interceptor launchers now deployed in Romania as part of the Aegis Ashore system and, soon, in Poland. (Russian officials have long complained to their US counterparts about the missile-defense batteries’ dual capabilities.)

A no-first-deployment agreement would also mean forgoing the Trump administration’s plans for new ground-launched, INF Treaty-prohibited missiles to counter Russia. This would be no loss: the air- and sea-launched missiles in US and NATO arsenals mean there is no military need for such weapons.

Key allies would likely view this as the best post-INF alternative. Germany has already declared its opposition to stationing new intermediate-range missiles in Europe. And Moscow may already be open to a new agreement along these lines. On February 2, Russian President Vladimir Putin suggested that “Russia will only deploy new missiles if United States does.” Putin’s pledge is only credible if he also agrees to remove the 9M729 missiles from locations that put NATO territory in their range.

Another possible approach would be to negotiate a new agreement that verifiably prohibits ground-launched, intermediate-range ballistic or cruise missiles armed with nuclear warheads. Such an approach would require additional declarations and regular on-site inspections of any ground-launched, INF Treaty-range systems.

As a recent United Nations Institute for Disarmament Research study explains, the sophisticated verification procedures and technologies already in place under the 2010 New Strategic Arms Reduction Treaty, or New START, can be applied with almost no modification to verify the absence of nuclear warheads deployed on shorter-range missiles.

This formula would reduce the most serious threats that could be posed by redeployment of ground-launched, intermediate-range missiles in the European theater, but would not prohibit either side from deploying large numbers of conventionally-armed missiles, and, therefore, it may not be deemed to be an adequate solution for either side.

Given that there is no buffer zone between the NATO's eastern flank and Russia, any intermediate-range missiles deployed along the frontier areas would have very short flight times to target, which could increase the temptation of one or the other side to launch first in a crisis.

To be of lasting value, a nonnuclear-armed intermediate-range missile framework would require that Moscow and Washington agree to extend New START by five years. New START is now scheduled to expire in 2021, and talks on extension have not yet begun.

Whether the Trump administration has the interest or diplomatic bandwidth to pursue post-INF missile limitation agreements for Europe is not clear. But leading NATO states most affected by the termination of INF Treaty, including Germany can and should, in coordination with the United States, develop such and engage in serious talks with Russia.

New START

New START, which caps each side's enormous and devastating long-range nuclear weapons to no more than 1,550 deployed warheads and 700 deployed strategic missiles and bombers, will expire in February 2021 if Trump and Putin do not agree to an extension of up to five years.

Russia has said it is ready to begin talks on a five-year extension of the treaty. The Trump administration, which has been conducting an interagency review of the treaty for over a year, is still undecided on whether to maintain or discard the agreement.

The US interagency review on New START is led by John Bolton's National Security Council (NSC). In 2017, shortly before he became the US National Security Advisor, John Bolton publicly called on President Trump to terminate New START.

On May 29, Tim Morrison, Senior Director for Arms Control at the NSC, said President Trump would not make a decision on New START until 2020.

Following his May 14 meeting in Sochi with Foreign Minister Lavrov, Secretary of State Pompeo said they had agreed that their respective "teams will begin to work not only on New START and its potential extension but on a broader range of arms control issues that each of our two nations have in our shared best interests in achieving agreement on."

But those meetings have not yet been scheduled.

In the twice-yearly New START Bilateral Consultative Commission meetings, Russia has raised concerns about the verification of the conversion of some US nuclear weapons delivery systems to conventional roles.

According to a January report by *The Wall Street Journal*, the Russian Ministry of Foreign Affairs send an 11-page paper to key Congressional Committee in December 2018 outlining Russians concerns on the conversion issue. According to the paper, the United States offered to provide a "cabinet-level" statement assuring Russia that the United States would not re-nuclearize the converted strategic delivery systems.

The United States, for its part, has understandably suggested that new Russian strategic nuclear weapons systems, including the Status-6 nuclear-armed long-range torpedo and the proposed nuclear-propelled long-range cruise missile, should be accounted for under New START.

In remarks at the April 15 Arms Control Association meeting in Washington, Russia's Ambassador to the United States Anatoli Antonov said Russia is ready to discuss extending the Treaty, but he repeated previously stated concerns about US compliance with some of the pact's conversion procedures.

"The extension of the New START is not a simple technicality that could be resolved in a couple of weeks. Serious issues must be settled."

Ambassador Antonov also said that the full array of Russia's planned new nuclear weapons would not be covered by New START, so any limits on them would need "another round of negotiations," which would require Senate and Duma approval.

If both sides are willing to engage in a professional dialogue relatively soon, these issues can be addressed in a mutually agreed manner either before or soon after a decision to extend New START is taken.

Trump's arms control gambit and challenges beyond New START

A new factor in the equation is the recent White House interest in pursuing a grand, new arms control deal with Russia and China.

According to an April 25 report in *The Washington Post*, Trump formally ordered his team to reach out to Moscow and Beijing on options for new arms control agreements. The instructions on Russia apparently call for the pursuit of limits on so-called non-strategic nuclear weapons, a category of short-range, lower-yield weapons that has never been subject to a formal arms control arrangement.

At first glance, that may sound promising. Bringing other nuclear actors and all types of nuclear weapons into the disarmament process is an important and praiseworthy objective.

But to date, the Trump administration has not provided any plan or strategy for such a far-reaching deal. Even if it did, negotiations would likely take years.

China, which is estimated to possess a total of 300 nuclear warheads, has never been party to any agreement that limits the number

or types of its nuclear weaponry. Beijing is highly unlikely to engage in any such talks until the United States and Russia significantly cut their far larger arsenals, estimated at 6,500 warheads each.

Russia is, in principle, open to broader arms control talks with Trump, but it has a long list of grievances about US policies and weapons systems, particularly the ever-expanding US missile defense architecture. The Trump administration's 2019 Missile Defense Review report says there can be no limits of any kind on US missile defenses – a non-starter for Russia.

If US negotiators seek limits on Russia's estimated 2,000 tactical nuclear weapons that are kept in central storage, Russia is sure to press for the removal from the US arsenal of approximately 180 tactical nuclear bombs deployed in five European NATO countries that can be delivered on fighter jets. Such weapons, which serve no meaningful military or deterrence mission for either side, should be eliminated. But any negotiations to verifiably reduce this other class of nuclear weapons will not be easy.

It is not clear yet whether United States is proposing that China must join New START or that Russia must agree to limits on tactical nuclear weapons as a condition for the extension of New START.

On May 29, the NSC's Tim Morrison equivocated. President Trump's "direction is pretty clear: He is interested in looking at the totality of Russian and Chinese programs," Morrison said, adding that Trump does not think it is advantageous to continue to "defer the difficult questions."

However, there is also nothing that prevents the Trump administration from extending the current agreement and *at the same time* beginning negotiations on new ones with Russia, China, or both.

And because there is no realistic chance to negotiate a more comprehensive New START replacement agreement by 2021, especially one involving China, the logical step for both sides is simply to extend the treaty by five years.

New START extension would provide additional time for Trump, or his successor, to pursue negotiations on more far-reaching nuclear cuts involving strategic and tactical nuclear systems, an understanding about

the limits of US strategic missile defenses, and limitations on non-nuclear strategic strike weapons that both sides are beginning to develop. Such talks could also take into account the intermediate-range missile systems that will no longer be prohibited under the INF Treaty.

If New START is not renewed

If Trump and Putin do not agree to extend New START in 2020, there are limited options available, depending on the scenario.

If a decision to extend is not announced before the May 2020 NPT Review Conference, it will be essential for all states parties to call upon the United States and Russia to:

- immediately agree to extend New START by five years, as allowed for in Article XIV of the Treaty;
- refrain from deployments of destabilizing ground-based, intermediate-range missiles; and
- hold regular, high-level talks on strategic stability to reduce the risk of miscalculation.

Failure by the US and Russian leadership to take these and other steps would represent a violation of their NPT Article VI obligations and would threaten the very underpinnings of the NPT regime.

If President Trump decides not to extend New START and he is defeated in the November 2020 election, the new president-elect will have very little time to try to extend the Treaty.

She/he should announce upon taking office that the United States will agree to extend the Treaty will provide additional political assurances to Russia that nuclear delivery systems converted to carry conventional munitions to meet the New START ceilings will not be re-nuclearized for the duration of the treaty and likely even longer, if Russia confirms that new strategic missiles, hypersonic vehicles launched from strategic missiles, and long-range cruise missiles and torpedoes will be accountable under New START.

If Trump is re-elected in November 2020 and does not agree to extend New START, Russia could propose that pending the conclusion of a

new nuclear arms control arrangement, Russia will not exceed the New START limits so long as the United States does not do so. Congress could act to prohibit funding for measures to increase US strategic nuclear warhead and delivery system deployments above the New START ceilings, so long as Russia remains below the limits.

Bottom line

Every US and Russian leader since John Kennedy and Nikita Khrushchev has successfully concluded at least one agreement to reduce nuclear dangers. These agreements have helped to slash nuclear stockpiles, manage nuclear competition, and provide greater stability, thereby reducing the risk of nuclear catastrophe between the world's two largest nuclear actors.

Progress has not always occurred in a straight line. And there is much more to be done.

The necessity and the opportunities for a productive, professional dialogue between representatives of the White House and the Kremlin on nuclear arms control and disarmament has not, in any way lessened.

It is time to restart the process with extension of New START and new understandings to prevent a new intermediate-range missile race in the wake of the termination of the INF Treaty.

1.2. AVERTING A REGIONAL NUCLEAR ARMS RACE AND CRISIS ESCALATION

Bruce Blair¹

The withdrawal by the United States and Russia from the Intermediate-Range Nuclear Forces Treaty has created a vacuum in the military space of Eurasia into which new and more weapons of various types are rushing. Absent some newfound spirit of cooperation between the ex-treaty parties as well as China, jockeying within this space, will doubtless intensify and the potential for instability and conflict will grow. The key unanswered questions are how costly and destabilizing this future portends. Can the parties find ways to avert an arms race, a crisis and a conflict in a post-INF world?

A tacit agreement or other mutual understanding that inhibits building, testing and especially deploying US and Russian nuclear-armed land-based missiles with ranges between 500 and 5,500 kilometers would strongly buttress these aims. Although the current US administration appears to be opposed to any and all restrictions on INF-range systems, they may be achievable under a new US administration seeking to improve US-Russian relations and revive arms control. In any case the alleged violations of the defunct INF Treaty would still need to be resolved, a method to distinguish between

conventional and nuclear weapons devised, and for the first time Chinese INF-range forces would need to be taken into account and possibly limited in some fashion.

The backdrop to the current INF imbroglio is a security landscape in which stability in Europe has already weakened considerably. US-NATO Russian relations are fraught, military tensions are high and the potential for escalation is significant. Military incidents now occur on a nearly daily basis. Frequent military encounters – aircraft intercepts, snap exercises, the “buzzing” and “shouldering” of ships, etc. – are the new norm (the ‘new abnormal’ in former Defense Secretary Perry’s words) in Europe as “signaling” with military force has replaced traditional diplomacy as the predominant means of sending messages to each other. The number of incidents doubled or tripled between 2013 and 2014, doubled again in 2017, and is even higher today. At an annual rate of over 200 incidents, it does look like both sides really are preparing for conflict. The Baltic Sea is the epicenter of the tension, but incidents are happening throughout the region in the air, at sea and on the ground.

Clearly, the United States and Russia are already entwined in an action-reaction spiral, and it has a nuclear as well as conventional dimension. Their military interactions have crossed into brinksmanship, including nuclear brinksmanship as, for instance, US and Russian nuclear-capable strategic bombers now routinely fly around the Baltic and Norwegian Seas. Provocative nuclear signaling is part of the “new abnormal.”

The same unsettling pattern has arisen in Asia, where rising tensions between the United States and China have produced a sharp rise in military incidents, especially in the South China Sea. And of course the same pattern of provocative actions is on display on the Korean peninsula as the United States and its East Asian allies and North Korea project force to intimidate, threaten and deter.

These intensifying military activities throughout Eurasia represent more than just signaling and alliance reassurance. In preparing

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for actual conflict, they fuel arms racing and raise genuine concern that interactions between opposing forces could provoke inadvertent or deliberate escalation that sparks a nuclear conflict. One illustration of this dynamic is the recently increased tempo of operations by US attack submarines staging out of Norway against Russian ballistic missile submarines based around the Kola Peninsula. This activity threatens the survivability of a key component of Russia's second-strike deterrent capability. It represents a deadly serious challenge with profound implications for the risk of crisis escalation and nuclear conflict.

Many of these de-stabilizing interactions are self-reinforcing and grow into complex dynamics that may easily spin out of control. A good illustration of such chain reactions is the situation in the Black Sea. After Russia intervened in Ukraine and Crimea, the United States stepped up its deployment of Aegis destroyers into the Black Sea. This was meant to challenge Russia in its backyard and reassure NATO allies as well as Ukraine. But the US destroyers also introduced a provocative strategic capability by carrying Tomahawk cruise missiles capable of striking deep inside Russia with little or no warning. Although non-nuclear, they in fact could reach all the way to Moscow from the northern Black Sea and strike and degrade critical Russian command, early warning, air and missile defense facilities, and even strategic forces. In response, Russia deployed additional attack submarines among other forces to counter the US ships. Then the United States responded by deploying anti-submarine aircraft to the region – to counter the Russian submarines that threatened US ships that reassured Romania but also threatened Moscow.

Many action-reaction dynamics like this are in play throughout Eurasia today. In the aggregate they constitute an escalatory updraft that could fan a spark into a firestorm through pre-programmed chain reactions. The space is a nuclear flashpoint where tensions could all too easily escalate to conflict and stoke the arms race.

Deploying new INF-class weapons – conventional but especially nuclear, to these theaters would clearly aggravate matters. Our

colleague Colonel General (ret.) Victor Esin seems to worry less about an ensuing arms race than about the specter of a profound miscalculation if nuclear-armed INF-range missiles are deployed in Europe. In his view, which I share, this would create an immediate danger of explosive escalation. In his words:

“If the United States deployed its intermediate- and shorter-range ground-based missiles in Europe near Russian borders, e.g., in the Baltic states, this would fundamentally change the state of the Russian military security. These missiles could be capable of delivering a preventive nuclear missile strike in one to four minutes which would strip Russia of its ability to respond within its current nuclear doctrine, which relies on a retaliatory nuclear capability. In this scenario, Russia would have to resort to a significantly weaker retaliatory nuclear missile strike, which would be unlikely to sit well with the military-political leadership of Russia. Moscow would be forced to amend its nuclear doctrine by including the possibility of launching a preemptive nuclear-missile strike against an aggressor preparing to attack Russia.”

This is a familiar refrain and a replay of the original INF confrontation in the 1980s which revolved around the specter of US Pershing II missiles with very short flight times to Moscow decapitating the Soviet command system, depriving it of the ability to launch on tactical warning of incoming US warheads, or otherwise severely degrading the strength and coherence of Soviet retaliation. This Cold War scenario and all its attendant risks is rearing its head once again in 2019. The main risk is that the pre-programming of Russian nuclear-armed strategic missiles for preemptive operations substantially increases the risk of a fatal miscalculation.

This Russian concern about possible future US INF deployments may be alleviated by several considerations. First, the current US budget for developing new land-based medium- and INF-range cruise, ballistic and hypersonic missiles as well as long-range (500-1,000 kilometers) cannons specifically calls for them to be armed with

conventional, not nuclear, warheads. Second, the US Congress is not in any mood to ramp up funding for nuclear or conventional variants. Third, there exists little or no appetite among US NATO allies to host any new nuclear-armed weapons of any kind or range on their territory. (This sentiment also pervades the attitudes of US Asian allies as well.) Fourth, Russia's current capability for launching on warning is already very doubtful given the 10-minute flight time to Moscow of US missiles on forward-deployed Trident submarines (in the Norwegian Sea, for example).

As a side note, I would argue that neither Russia nor the United States should be striving to preserve the option to launch on warning. Maintaining this posture runs myriad risks including launching on false warning. One of the silver linings of the current INF debate may be in drawing attention to this danger, which is growing worse in an era of cyberwarfare, which could play havoc with command systems whose early warning inputs may be corrupted and whose missiles are poised for immediate launch upon receiving a short stream of computer signals – the case for silo-based strategic missiles. Both sides should instead be striving to move away from launch on warning as well as first-strike and preemptive options, and toward a policy of no first use.

No rational US or Russian leader would ever resort to the first use of nuclear weapons against the other, however, the risk of a confrontation spinning out of control in the fog of crisis and of leaders blundering into a nuclear war would grow if the United States and/or Russia equip ground-based INF-range missiles with nuclear warheads and deploy them on launch-ready alert.

Both sides should voluntarily refrain from doing so, but an even better remedy would be for them to observe a joint moratorium on their deployment. Better yet, they should correct their past mistakes and negotiate a new agreement that verifiably prohibits ground-launched, intermediate-range ballistic or cruise missiles armed with nuclear warheads.

This is a somewhat challenging idea because Russian weapons

systems are generally dual-capable. I do not know whether the Russian systems can switch back and forth between conventional and nuclear or whether they just plan to have both, but that is important and needs clarifying.

Verifying a ban on land-based nuclear INF weapons should be possible with additional declarations and regular on-site inspections. The Black Sea experiments back in the 1980s showed how monitoring could be undertaken with remote (close in) sensors near the delivery platforms. Routinely verifying the absence of fissile materials on INF missiles could be accomplished at regular intervals with such on-site sensors coupled with remote monitoring using national technical means to detect possible nuclear warhead relating to delivery vehicles between the intervals.

Such an approach still leaves the future of the 9M729 Russian cruise missile open to question. Because this mobile missile will remain controversial due to its disputed range, its disposition is an important matter to resolve, not only for reestablishing confidence in a nuclear ban on INF-range nuclear missiles but also for preserving faith and confidence in Russia's compliance with New START and other potential follow-on strategic arms agreements. Establishing geographic deployment limits such as the old Atlantic-to-the-Urals boundaries as a confidence-building measure should be of interest. It would be key, however, to be able to ensure periodically through on-site monitoring and satellite observation or other means that (a) they are not outfitted with nuclear weapons, and (b) if they are dual capable and thus able to be mated with nuclear weapons that they remain at bases beyond the range of NATO countries and are not re-located. An agreement to put them on display on say a periodic (weekly?) basis and to notify of any movements beyond base would be helpful. Any unscheduled movements would be cause for concern.

A similar approach could be undertaken to banning nuclear-armed Chinese as well as US and Russian INF-range weapons in Asia. Both the United States and Russia are keen to open up this space to

deploying conventional INF-range weapons in order to counter the roughly 1,500-1,800 cruise and ballistic missiles in China's arsenal, almost all of which are believed to be conventional. China's build-up of INF-class missiles as well as their proliferation throughout Asia including among US allies and friends like Japan, South Korea, and Taiwan is stimulating an unconstrained arms race and creating new security challenges throughout the region. Among other adverse consequences, the extensive testing of these systems as well as long-range strategic missiles has been triggering false alarms in missile attack early warning networks. For example, ambiguous ballistic missile threats have risen to the level of US presidents on multiple occasions during the past 15 years and triggered the early stages of presidential emergency decision-making. (That never happened during the Cold War).

Although existing and future build-ups of conventional missiles by these parties are cause for concern, a build-up of regional nuclear missiles is much more concerning and preventing it will require China to participate in establishing new "guard rails" against further expansion of the parties' arsenals. China shows absolutely no interest in joining such an effort. It complains that it already exercises enormous restraint in nuclear arms deployment compared to Russia and the United States, and that these two countries will need to slash their arsenals before China will enter into nuclear arms negotiations with them.

Nevertheless, a good case can be made that it is strongly in China's interest to avoid a regional build-up of INF-range nuclear missiles and that China has to accept some limits on its own regional nuclear forces if it is going to demand that the United States and Russia permanently observe a "zero option" in Asia for this class of weapons. China thus needs to be engaged and pressed to begin a serious dialogue on this question.

Putting this concern aside, could the United States and Russia agree to numerical limits on land-based INF missiles? If so, at what level and how will it be verified. Access to production lines might well

be required. Not sure that is going to happen. We might just do declarations that neither side will have more than xxx (Editor's note: more than a certain amount of missiles), but not sure that would work for the US side that wants to have a lot of these in the East Asian scenarios. I have not heard numbers, but I assume they will want hundreds to try and address China's arsenal. I don't think Congress will fund so we have time here.

Another option here would be limits on all INF systems, including ship and air-based but that is even harder to bound.

Banning INF-range nuclear-armed US and Russian land-based missiles in Asia would be a sensible approach to averting a nuclear arms race between them in the region. It also seems worth considering inviting China to the table to negotiate such a ban. China currently possesses and estimated 115 nuclear warheads on short- and medium-range delivery systems. It should have a security interest in joining an agreement that at least limits if not bans the deployment of such weapons by Russia and the United States.

1.3. WHAT NEEDS TO BE DONE AFTER THE TERMINATION OF THE INTERMEDIATE-RANGE NUCLEAR FORCES TREATY

Vladimir Dvorkin¹

It is becoming abundantly clear that the Intermediate-Range Nuclear Forces Treaty, which entered into force in 1988, is coming to an end.

In order to buy time in the absence of the Treaty, every effort should be made to prevent the deployment of INF-Treaty prohibited missile systems, particularly in Europe. A good first step would be to make a suggestion to Russia to stop the deployment of 9M729 cruise missiles, which is considered a breach of the Treaty and which is denied by Russia. United States, for its part, should provide Russia with technical details to demonstrate that MK-41 launch systems in Romania and Poland cannot launch Tomahawk cruise missiles.

That being said, regardless of whether or not these suggestions will be implemented, one can foresee at least five possible courses of action that the United States and Russia might take in the near future, which will have differing impact on the way EU states' leadership and population perceive threats to their national security.

Scenario 1: In the next 3-4 years, the United States will not deploy any type of ground-launched intermediate-range missiles in Europe or

Asia-Pacific region. Russia will not do it either, pursuant to the declaration made by President Putin that Russia's actions would come as a response and mirror those of Washington. In the meantime, the parties will report that the development of ground-launched intermediate-range missiles is well under way. (All reports of the near future missile flight tests are proved premature, as no allocation has been made to fund it).

Scenario 2: If after the completion of the development of intermediate- and short-range missiles, they do start to arrive to the territories of the European Union and Russia, those would likely be conventionally-armed ground-based Tomahawk and Kalibr cruise missiles. Germany, France and several other countries would probably refuse to allow US missiles on their territory. The most likely to host these weapons are Poland, Romania and the Baltic States.

Scenario 3: It is possible that the United States might deploy its intermediate and short-range missiles only in the Asia-Pacific region, since the US administration occasionally expresses concerns about the increasing threat posed by Chinese intermediate-range missiles of different types. Russia might deploy its missiles only in the eastern part of the country. In doing so, it would have to take into account possible reaction from China. Therefore, in order to avoid confrontation with its strategic partner, Russia would have to keep the number of deployed weapons to a minimum.

Scenario 4: Having finished the deployment of conventionally-armed missiles in the European Union and Russia, the United States and Russia would move on to the deployment of nuclear-capable intermediate-range cruise missiles. This process might take a long time because in order to ensure nuclear safety and security the relevant infrastructure for safe storage and operation of nuclear components would need to be further developed.

Scenario 5: In addition to cruise missiles, the United States and Russia might decide to develop and deploy nuclear-capable intermediate-range ballistic missiles. The United States might resume

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production of Pershing II and further improve their performance. Russia would be able to match the United States by using stages of missiles, such as Topol-M and Yars, and, in the absence of the follow-on treaty to New START, through the deployment of strategic missile complex Rubezh with MIRV for tasks in the European theatre. As a result, the state of relations between the United States, Russia and the European Union would reach more dangerous and critical stage than the one that existed in the 1980s. This would be aggravated by recent technological development and closer geographical proximity to planned targets.

One could assume that the reaction to these developments among EU governments and populations can range from relatively calm and measured (in scenario one) to extreme and radical (in the latter scenarios).

The end of INF Treaty would lead NATO countries to close ranks, including on matters related to increase in military expenditures and significant expansion of the NATO's missile defense system. Meanwhile the United States will remain out of the reach of Russian intermediate-range missiles, the threat of which would loom over Germany, France, Italy, Turkey, Iran, China, Japan and other countries with whom Russia is trying to improve relations.

However, a scenario in which the developments in the projected period will proceed in a peaceful manner cannot be ruled out. This scenario might be possible to achieve through following the suggestions made by President Trump, and earlier by President Putin, on the facilitation of negotiations on limiting intermediate-range ballistic and cruise missiles. It is first necessary to attempt to engage China in the negotiations.

When the presidents made these proposals, they probably had little to no understanding of the subject matter of the INF Treaty, in particular of the technical and organizational aspects of verification, its implementation requirements and the notification system. An establishment of trilateral inspection teams systematically carrying out

inspections to evaluate the condition of deployed and non-deployed intermediate-range missiles of each state would be hard to imagine.

There are two main reasons why trilateral negotiations on this issue will drag on for years. China has traditionally been unwilling to disclose any information about its nuclear capabilities. Therefore, convincing it to disclose at least a portion of this information will be quite hard and will require certain concessions from other parties – in particular from the United States – such as restricting the ABM systems in the Asia-Pacific region. Second, according to expert estimates, the largest percentage of China's arsenal of missiles are intermediate-range missiles that they are not likely to give up. Ultimately, achieving an INF-type agreement among the three countries is hardly feasible due to the need of consistent monitoring of its compliance.

It is hard to imagine an expansion of the INF verification regime for the elimination of weapons. US and Soviet inspectors oversaw all the aspects of the destruction process during their detonation, launches and flattening of their front section. They stayed in the vicinity of the missile manufacturing plants and monitored their perimeter. It is obvious that the establishment of such a cross-verification system cannot be expected in the immediate term.

In any case, these negotiations might go on for many years and, in the best case scenario, result in some sort of common agreement that would bring certain level of transparency about these weapons. In addition, it would be advised to delay the deployment of nuclear and conventional missiles in Europe as much as possible. These suggestions are based on the experience of negotiations between the United States and the Soviet Union on nuclear arms reduction that resulted in the adoption of SALT II, START I, START II and New START treaties. In the process of the negotiations the Soviet Union halted the deployment of its Kuryer and Skorost mobile missile systems, as did the United States with its Midgetman. For example, all the technical decisions concerning the replacement of multiple reentry vehicles on SS-19 and Minuteman-III missiles by single warheads, and the

decision to pour concrete into the silos of heavy missiles in order to fit them with Topol missiles, were taken through pilot projects run during the negotiations on START II, though the treaty itself never actually entered into force. Also, the production of rail-mobile missile systems was discontinued, with three times fewer than planned being produced. The parties reasoning was that it made no sense to develop and test new systems, or to increase the numbers of existing missile systems, if in the end they would still need to be eliminated.

Obviously, all of that experience has to do with bilateral negotiations only. Some experts are not convinced that such negotiations would be able to delay the arrival of intermediate-range missiles with nuclear and conventional warheads. However, the opportunity is present and it should be seized. It is therefore would be right to support the proposal made by the two presidents to proceed without delay with trilateral negotiations.

1.4. IS IT POSSIBLE TO MAINTAIN STRATEGIC ARMS CONTROL AFTER 2021?

*Linton Brooks*¹

Introduction

The New START Treaty – which Russians often call START III² – entered into force in February 2011 and will expire in February 2021, although it can be extended a single time for up to five years by mutual agreement, without the need for ratification. Its implementation has gone smoothly and the New START Treaty was often considered a bright spot in our relationship. Yet many analysts, especially in the United States, doubt that a follow-on treaty is possible.³ There are four reasons for this pessimism:

- The current political tension between the Russian Federation and the United States.
- Doubts on both sides that the other is a reliable negotiating partner.

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² The formal title is the *Treaty Between the United States of America and the Russian Federation on Measures for the Further Reduction and Limitation of Strategic Offensive Arms*. For convenience this essay will use the name “New START.”

³ Skeptics include the present author. For a discussion of the rationale and implications, see Brooks L. After the End of Bilateral Nuclear Arms Control. Next Generation Nuclear Network. October 24, 2017. Available at: <https://nuclearnetwork.csis.org/end-bilateral-nuclear-arms-control/>; Brooks L. The End of Arms Control. Forthcoming in the journal *Daedalus* in early 2020. Some of the material in the present article is drawn from those previous efforts.

- Disagreements on specific issues within New START, which will necessarily form the basis for a follow-on treaty.
- Incompatible positions on what else should be included in a new treaty, with the greatest disagreements being on Russian desires for limits on ballistic missile defense and US insistence on including non-strategic nuclear weapons.

This essay reviews the rationale for treaty-based arms control, the challenges to a follow on treaty and possible solutions to those challenges. It then suggests an approach that might lead to a follow-on treaty that is in the interests of both sides. There is no technical reason why a treaty-based arms control regime cannot be preserved. But doing so will require political will and compromise on both sides.

Why have Russia the United States sought arms control in the first place?

In essence, arms control is a means of achieving strategic stability,⁴ which in turn is a way of dealing with the implications of Mutual Assured Destruction. In the time it takes to read this essay, the United States and the Russian Federation can destroy one another as functioning societies. Neither is likely to do so because each side maintains forces that could survive a first strike and inflict devastating retaliation. As a result, nuclear war has become irrational. Because neither side can be certain of controlling escalation (especially once the nuclear threshold is crossed), conventional war between nuclear states is also—or at least should be—too risky to contemplate. Mutual Assured Destruction is a frightening and unsatisfactory concept. Many experts have sought a way to move beyond it. They have not found one. That is because Mutual Assured Destruction is not a policy to be embraced or rejected but a fact to be accepted and managed.

⁴ The term “strategic stability” is subject to varying interpretations. The Russian government uses a very expansive definition that sometimes seems to be a synonym for national security policy. This essay uses strategic stability because, narrowly defined in the terms indicated below, it remains the most useful concept for assessing the contributions of arms control to the prevention of nuclear war.

In managing a relationship characterized by the reciprocal ability to inflict devastation, Russia and the United States have found the concept of strategic stability to be helpful and perhaps central to preventing war. By the end of the Cold War, analysts in both the Soviet Union and the United States had a similar understanding of the basic premises of strategic stability and of the importance of those principles in avoiding catastrophe. They understood that the concept was primarily bilateral and was primarily about preventing nuclear war. To foster such stability, the two superpowers sought policies, forces, and postures that met three criteria:

- In time of great crisis, there is no incentive to be the first to use military force of any type, nuclear or otherwise (“crisis stability”);
- In crisis or conventional conflict, there is no incentive to be the first to use nuclear weapons (“first strike stability”);
- Neither side believes it can improve its relative position by building more weapons (“arms race stability”).

Many people assume arms control is an obvious good, but it is not. Instead it is one possible tool to improve national security and enhance strategic stability. Modern US arms control theory starts with Tom Schelling and Mort Halperin’s seminal work, *Strategy and Arms Control*. Writing in 1961, they say, “We use the term ‘arms control’.... to mean all the forms of military cooperation between potential enemies in the interest of reducing the likelihood of war, its scope and violence if it occurs, and the political and economic costs of being prepared for it.”

Many practitioners (including the present author) are dissatisfied with the goals implied by this definition. They doubt arms control reduces the likelihood of deliberately initiating war, which will be based on political considerations. (Arms control can, however, reduce the risk of conflict based on erroneous perceptions that an attack is imminent). Further, they question whether we know how to reduce the scope and violence of war once the nuclear threshold has been crossed. These practitioners have a somewhat different list of what bilateral arms control can do:

1. Provide public recognition that the two sides regard one another as important equals.
2. Provide communication in difficult times.
3. Provide transparency which leads to predictability which in turn enhances stability.
4. Avoid an action-reaction arms race where each side builds new systems in anticipation of similar moves by the other. In some cases, it may be possible to close off militarization of a specific technology.
5. Reduce incentives to preempt in time of crisis (provide first strike stability) by shaping the structure of forces (e.g., stressing bombers over missile, or reducing the role of fixed – and thus vulnerable – ICBMs with multiple warheads).
6. Save money by capping expenditures on new systems.
7. Reduce the chance of inadvertent escalation caused by mismanagement during crises.
8. In addition to these stability benefits, arms control treaties can help improve the overall political relationship. Finally, those who believe that nuclear abolition is a feasible goal want to negotiate lower numbers to move closer to zero.⁵ New START is the latest attempt to achieve at least some of these goals.

Why is a replacement for New START so challenging?

There are at least four reasons why negotiating a replacement treaty will be challenging. They are:

Political tension

The biggest challenge to concluding a new treaty arises from mutual mistrust. There is a belief among some senior Russian leaders that the United States seeks a first strike capability in order to coerce

Russia into accepting American hegemony and is also actively seeking to covertly change the current Russian government. In turn, many Americans are convinced that Russia is systematically interfering in American and European elections to undermine faith in democracy and that its aggressive actions in annexing Crimea and destabilizing Ukraine are threats to international peace and order. As a result, both sides view the other with hostility and suspicion. This means that even future cooperation, even that which is in both countries' interest, will be challenging.

Doubt that the other side is a reliable negotiating partner

Many in the United States have concluded Russia is not a reliable negotiating partner because it cannot be trusted to adhere to agreements it makes. The universal view in the United States that Russia has violated the Intermediate Range Nuclear Forces Treaty (INF Treaty)⁶ has poisoned the political well. In addition to INF, the United States has formally determined that Russian is violating the Chemical Weapons Convention, Open Skies Treaty, and Conventional Forces in Europe Treaty and is not adhering to the politically binding 2011 Vienna Document.⁷ While thus far Russia is in compliance with New START, it would not be unreasonable for the United States to conclude that if New START or its replacement becomes inconvenient, Russia will violate that too.

Russians, in turn may be skeptical that agreements with the United States will outlast the administration that made them. They could point to a series of agreed measures taken during review conferences of the Nuclear Non-Proliferation Treaty but ignored by subsequent administrations, to the US repudiation of the Joint Comprehensive Plan of Action (JCPOA) on Iran, to the US “un-signing” of the Arms Trade Treaty⁸ and

⁶ For details of the US allegations see Director of National Intelligence Daniel Coats on Russia's INF Treaty Violation. Office of the Director of National Intelligence, Speeches and Statements. November 30, 2018.

⁷ Adherence to and Compliance with Arms Control, Non-Proliferation and Disarmament Agreements and Commitments. United States Department of State. April 2019.

⁸ Presidential Message to the Senate of the United States on the Withdrawal of the Arms Trade Treaty. April 29, 2019.

⁵ Whatever the ultimate desirability and feasibility of abolishing nuclear weapons, the failure of nuclear-weapons possessing states to show any interest following President Obama's 2009 Prague speech coupled with the increasing tension among the major powers suggests that the conditions permitting serious consideration of such a step are unlikely to be present in the coming decades. As a result, abolition will not be considered further in this essay.

to persistent rumors that the United States is considering similar action with respect to the Comprehensive Nuclear Test Ban Treaty. Both sides will have to overcome suspicions for future negotiations to succeed, a task made more difficult by the current tensions between them.

Disagreements on specific issues with New START

New START will necessarily form the basis for a follow-on treaty. But Russia has issues with the conversion procedures the United States has used to reduce the number of operational launchers on ballistic missile submarines and to convert some B-52H bombers to non-nuclear roles. The United States, in turn, seeks assurances that novel delivery systems like the Russian intercontinental nuclear-powered cruise missiles, high-speed intercontinental range nuclear-armed torpedo and hypersonic boost-glide vehicles announced by President Putin in his March 2018 address to the Federal Assembly will be incorporated into the treaty regime.

Incompatible positions on what else should be included in a new treaty

Even if the two sides want to negotiate a follow-on to New START, doing so may prove too difficult. There are important issues where the two sides have irreconcilable positions which one or the other side asserts must be resolved in their favor before a new strategic arms treaty would be acceptable. The two most significant are ballistic missile defense and non-strategic nuclear weapons. Russia seeks legal limits on performance of US ballistic missile defense interceptors which the United States rejects. The United States seeks limits on Russian tactical weapons, which Russia rejects. There are also issues related to weapons in space and conventional strategic strike. Without a compromise future bilateral arms control will be impossible.

Alternate approaches to a new treaty

The problems set forth above seem intractable. Many will conclude that the differences are so significant that a negotiating a replacement is impossible. That may be true, but international negotiations are often impossible until they aren't. The two sides could conclude that the

potential benefits to each side of a replacement treaty (transparency for the United States and capping US modernization for Russia) are sufficiently compelling that a legally-binding replacement treaty is in their mutual interest.

The simplest way to accomplish this is to limit the replacement treaty to the scope of New START, relegating consideration of non-strategic nuclear weapons, ballistic missile defense, space strike weapons and any other issues to a separate, longer-term negotiation (perhaps under the rubric of a strategic stability dialogue) whose conclusion is not a prerequisite for ratification and entry into force of the replacement treaty.

Under this approach the replacement treaty would extend most provisions of New START with only modest updating. It would be necessary to deal with Russian concerns over the adequacy of the US procedures for reducing the number of accountable launchers on ballistic missile submarines and for verifying the non-nuclear status of converted B-52H bombers. Procedures would also need to be included for taking account of novel delivery systems like the Russian intercontinental nuclear-powered cruise missile and high-speed intercontinental range nuclear-armed torpedo. Given political will, dealing with these issues should be straight forward technically, although probably time consuming. Potentially more difficult would be reaching agreement on hypersonic boost-glide vehicles. At a minimum, those launched from silos and having intercontinental range should count against New START limits even though they do not follow a ballistic trajectory over most of their flight range (currently the definition of silo-launched missile that count). Aircraft capable of carrying hypersonic weapons of greater than 600-kilometer range (an accepted delimitation range from past agreements) should count as heavy bombers.

Given political will, dealing with these issues should be straight forward technically, although probably time consuming. It would be best to commit to their resolution at the time of extension, but not to delay extension until they were resolved.

While such an approach is the least complex and most direct path to a replacement treaty, it is unlikely to be acceptable to either side. Both will fear that their major objectives will be ignored. Thus, the replacement treaty must include non-strategic nuclear weapons, ballistic missile defense and perhaps other issues. (See below for a suggested mechanism to increase the chances of good faith negotiation.)

The replacement treaty could provide for further reductions in strategic forces, but that should not be a major objective. Although there will be voices in the United States insisting on further reductions, neither government appears interested in more reductions at this time. Stability is more important than additional reductions.

There is a risk that any approach to a replacement treaty will be doomed at the outset. Influential voices in both countries call for direct involvement of China in formal negotiations. This would be a huge mistake. China has made it clear it will not take part in such negotiations. Insisting on China's joining US – Russian bilateral negotiations is a formula for failure. There are areas where Russia and the United States should engage China on nuclear issues, but such engagement should be kept separate from bilateral discussions on a replacement for New START.

Major issues and possible solutions

Even if the two sides both want to negotiate a follow-on to New START, doing so may prove too difficult. There are several important issues where the two sides have irreconcilable positions which one or the other side asserts must be resolved in their favor before a new strategic arms treaty would be acceptable. If both sides maintain their current positions no replacement treaty will be possible. This section reviews the issues and suggests possible compromise approaches.

National ballistic missile defense

The United States has concluded that it must defend its homeland against ballistic missile attack from North Korea or Iran. It believes

that effective defense against the relatively crude, first generation missiles of these two states is technically feasible and that US limited understanding of decision-making processes of these two governments makes it imprudent to depend entirely on deterring attack by threat of retaliation. As a result, the George W. Bush administration withdrew from the Anti-Ballistic Missile Treaty of 1972 (ABM Treaty) to deploy a national ballistic missile defense based in California and Alaska. The small size of the defenses (currently 44 interceptors but to be increased to 64) would be consistent with the ABM Treaty but the national coverage would not.

The Bush administration also planned a third national defense site in Poland. The Obama administration cancelled the planned site and instead deployed regional ballistic missile defenses in Europe to counter a potential Iranian nuclear missile threat to NATO allies. Russians interpret this European deployment as aimed at them. Although the United States asserts such defenses will have no real capability against Russian strategic forces, Russian analysts and officials fear that such defenses threaten (and may be intended to threaten) its strategic deterrent. Many Russian experts accept that the current system has very limited effectiveness against Russian ICBMs but fear that it will sooner or later be improved to gain such a capability.

As a result, Russia insists that legally binding limits on the performance of European defenses are a prerequisite for any new arms control discussions. Both the previous and the current administration found such limits unacceptable. This will almost certainly be the position of the next administration even if President Trump is not reelected. Even if a future administration were willing to negotiate them, any treaty limiting ballistic missile defenses could not be ratified by the current or any plausible future Senate. This dispute is the most serious obstacle to any future arms control agreement.

To partially meet Russian concerns, the two sides could conclude a legally-binding agreement to exchange plans for the numbers and locations for future deployments of ballistic missile defense interceptors

over, for example, the next ten years. These plans would be updated annually and there would be a commitment not to change them without, for example, three years notice.⁹

To supplement this provision, the United States should renew past offers to have Russians measure the results of ballistic missile tests using their own equipment and Russia should accept that offer. This will allow Russia to have a better assessment of the actual threat to its strategic forces from regional ballistic missile defenses.

These modest provisions are a long way from Russian demands for legally binding limits on a range of performance parameters, but they are almost certainly the most that the United States will agree to. Ultimately, Russia will need to decide whether the benefits of the other provisions of a replacement treaty outweigh this limitation. It can only do so after it sees the results of the proposed future negotiations.

Non-strategic nuclear weapons (NSNW)

Russia has a significant advantage in so-called non-strategic nuclear weapons (those designed for use at less than intercontinental ranges). This poses a significant threat to American allies. Russian weapons include air defense, shorter range missiles, tactical bombs, anti-ship and anti-submarine weapons while the United States has only a relatively small number of tactical bombs, some of which are stored in Europe for use by NATO allies. The Resolutions of Ratification for both the 2002 Treaty of Moscow and the 2010 New START Treaty mandate including such weapons in any future arms control treaty. In a June 18, 2019 interview discussing his doubts over extending New START, Ambassador John Bolton, then the National Security Advisor and widely assumed to be one of several administration officials skeptical of the value of arms control in general, said of extension, “There’s no decision, but I think it’s unlikely.” His primary objection was that the treaty has no limitations on tactical or

non-strategic nuclear weapons. “That flaw remains today,” he said, “so simply extending it, extends the basic flaw.”¹⁰ Ambassador Bolton is no longer part of the US administration, but the attitude he expressed is very much alive.

One approach long advocated within the United States is to agree on a single limit on all warheads, thus balancing US advantages in spare weapons and upload potential against Russian NSNW advantages. This approach was first developed 20 years ago, in part to meet Russian concerns about US upload potential, concerns that no longer appear central to the Russian Federation.¹¹ Russia has rejected the concept of verifying such a limit as too intrusive, called for removal of US theater nuclear bombs from Europe as a precondition for any discussions and has given no indication it is willing to consider even modest data exchanges on NSNW, let alone limits.

Because the Russian concern is with the intrusiveness of verification, the two sides should consider establishing a binding limit on total warheads, a data exchange on numbers and locations (there is START I precedent for keeping such an exchange private) and a system of notifications of changes, but without any physical verification. Normally the United States opposes limits which are not subject to verification, but it may have the same concerns over Russian access to US weapons storage facilities that Russia has with its own storage areas.

If even this proved unacceptable, Russia and the United States could agree to exchange information annually on the total numbers of so-called non-strategic nuclear weapons each side possesses, on the types of those weapons (bombs, air defense, cruise missiles, etc.) and where such weapons were normally deployed (in general, not specific terms). It is not clear whether this would be sufficient to meet US concerns.

¹⁰ Washington Free Beacon interview quoted in Taheran S., Kimbal D. Bolton Declares New START Extension ‘Unlikely’ // Arms Control Today. 2019. Vol. 49. Available at: <https://www.armscontrol.org/act/2019-07/news/bolton-declares-new-start-extension-unlikely>.

¹¹ The United States could roughly double the number of ballistic missile warheads it deploys under New START simply by uploading without adding any missiles or launchers. See Manzo V. Nuclear Arms Control Without a Treaty: Risks and Opportunities After New START. CAN Corporation. April 2019. Available at: https://www.cna.org/CNA_files/PDF/IRM-2019-U-019494.pdf.

⁹ Such an agreement would meet Russian requirements for something legally binding and would deal in some degree with Russian concerns about future improvement while (probably) being capable of gaining approval by Congress. I am indebted to Ambassador Steven Pifer for the concept.

Space-strike forces

Russia fears the United States will deploy space-based weapons capable of striking strategic targets on the surface of the earth with virtually no warning. If this were true, the threat to strategic stability would be significant. There is, however, no evidence that either side is currently pursuing such a capability, although there are individual advocates for doing so. Despite this, Russian experts routinely raise resolving the issue as a prerequisite for further arms control agreements. The proposed Russian solution is a sweeping treaty on preventing an arms race in outer space tabled in the Conference on Disarmament (a United Nations consensus-based multilateral negotiating forum that has been effectively moribund for years). The United States regards Russian proposals as unverifiable and unworkable.

The control of space, including defending satellites from attack will be a feature of future warfare. Capabilities in this area are highly classified on both sides. Neither Russia nor the United States will be willing to engage in meaningful negotiations in this area. Fortunately, meeting the Russian concern with space-strike weapons does not require negotiations on space control. To meet the Russian concerns with attacks from space on the surface of the earth the two sides could agree to ban the testing of such weapons, to be verified by national technical means of verification. While deorbiting might be done without detection, for “space strike” weapons to destroy strategic targets with no notice they would need to be highly accurate. Developing such accuracy implies a testing range that would be detectable through national technical means.

Conventional strategic strike

In recent years Russian experts have expressed concern with US long-range precision strike capabilities. Their most common assertion is that such weapons, especially conventionally-armed sea-launched cruise missiles, could preemptively destroy Russian ICBM silos and other strategic nuclear forces, thus limiting Russia’s ability to retaliate. It is not clear how seriously the Russian government (as opposed

to the Russian expert community) takes this issue. Most US experts regard the threat as fanciful and the United States has, therefore, given very little thought to how it might respond if this became a serious negotiating issue.¹²

If it is important to the Russian government to deal with this issue, the sides could reach agreement on a data exchange as a confidence building measure. Russian concern with “conventional strategic strike” appears primarily focused on sea-launched cruise missiles. The two sides could exchange annual declarations of the planned number of sea-launched cruise missiles with ranges above 600 kilometers and configured for land attack to be deployed, as well as the types of ships and submarines capable of carrying such weapons. Since there would be no verification, it would be more appropriate to have the agreed exchange in a side agreement. Best of all, however, would be to drop this subject.

A path forward

Because the nuclear aspects of a replacement treaty must build on the experience of New START, the two sides should agree to extend that treaty for the full five years allowed. In doing so, they should make a formal commitment that the replacement treaty will deal with Russian concerns with US conversion procedure, with incorporating all of the novel Russian systems designed for delivering nuclear weapons at intercontinental ranges into the replacement treaty and with dealing with both non-strategic nuclear weapons and the implications of ballistic missile defenses in Europe.

The announcement of the extension of New START should make it clear that the sides believe that such an extension is only acceptable if there is genuine progress on the issues they have agreed to cover. They should announce that they will each review progress annually and will

¹² The United States has significant military concerns with Russian conventional and nuclear strike capability at the regional level but has not thus far sought to deal with those concerns through arms control.

not hesitate to withdraw from the treaty if adequate progress is not being made.¹³ They should set a joint goal of having the replacement treaty ready for signature by February 2024, three years after the current expiration of New START.

Conclusion

Whether or not New START lapses without replacement, the need to prevent nuclear war will remain. The restrictions and burdens of arms control treaties are only worth bearing if those treaties prevent arms races and reduce the risk of conflict. It is not clear whether the United States and the Russian Federation can agree on the terms of a new treaty that they each believe is in their interests. But they will not know until they try. Each side will need to remember that the criterion for success is not whether they are completely happy with the outcome. They will not be. Instead, the question they must ultimately answer is whether the treat that emerges from negotiations is better than entering a world where, for the first time in half a century, there is no regulation of the nuclear balance between the two largest nuclear powers on the planet,

Success will not be easy. It will demand creative thinking and analysis and may require a willingness to consider unorthodox approaches. It will certainly require accepting less than perfect outcomes. And, after years of work, the effort may fail. But the chance of preserving and improving stability is worth the risk.

¹³ It would be preferable to have a series of one-year extensions, but the terms of New START do not permit this.

1.5. THE POSSIBILITY OF PRESERVING STRATEGIC ARMS CONTROL AFTER 2021

*Viktor Esin*¹

It is a well-known fact that the US-Russia strategic nuclear arms control regime is regulated by the provisions of New START Treaty, which was signed in Prague in 2010, and entered into force on February 5, 2011. The Treaty is due to expire on February 4, 2021. However, Article XIV of the Treaty stipulates that, “if the Parties decide to extend this Treaty, it will be extended for a period of no more than five years.”

The inevitable termination of INF Treaty is a serious obstacle in achieving the extension of New START Treaty, and, even more so, to adopt in the next two years a new treaty on strategic offensive arms that would include the United States and Russia, or – as Washington hopes – the United States, Russia, and China. The current state of US-Russian relations, exacerbated by the internal political situation in the United States, precludes any possibility of a constructive dialogue between the two countries on arms reduction and limitation in the near future, let alone conclusion of any new agreement in this area.

Therefore, now, Russian President Vladimir Putin and US President Donald Trump have no other way to preserve the strategic nuclear

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arms control regulated by a formal agreement, except to extend New START Treaty by following the process described in Article XIV of the Treaty.

That might be possible if the United States and Russia manage to avoid exacerbation of confrontation following the end of the INF Treaty. At minimum, they would need to renounce the deployment of short- and minimum-range ground-based missile systems in Europe.

Do the United States and Russia have incentives to keep the New START Treaty?

For Russia, it is the desire to limit US ability to build up its strategic nuclear capabilities, thus avoiding a nuclear arms race between them.

For the United States, it was formulated by General John Hythen, then head of the US Strategic Command. During the hearing before the Senate Armed Forces Committee in February this year, he purported that New START Treaty would provide the United States with extremely valuable insight into what Russia does with regarding strategic nuclear weapons. He is absolutely right about that. After all, in 2021, Russia will embark on mass production and deployment of advanced strategic offensive weapons, such as the Avangard and Sarmat ICBMs, new Borei-A-type nuclear-powered ballistic missile submarines (SSBNs) and deeply modernized Tu-160M2 strategic bombers with upgraded nuclear weapons. If the New START Treaty remains in effect, these strategic nuclear weapons would fall within the scope of the Treaty, and therefore be subject to on-sight monitoring by US inspection teams. Another reason why the US military might be interested in preserving the New START Treaty is that the United States has no plans to deploy strategic nuclear weapons until the year 2026.

Moscow has repeatedly stated that its offer to engage in a discussion on the issues relating to the possible extension of the New START Treaty is still valid. However, as Russian Foreign Minister Sergei Lavrov purported in March 2019, the United States had to fully honor its commitments under the New START Treaty before the parties

could engage in substantive discussions on the Treaty's extension. He explained that the US unilateral decision not to count its strategic offensive weapons under the Treaty that they claim to have been re-equipped, something that Russia cannot yet confirm though this is required by the Treaty itself. He also added that this major concern could be addressed through the procedures set out in the Treaty. The real question is whether policymakers in Washington have enough political will to do that.

What Sergei Lavrov was referring to when talking about Russia's complaints vis-à-vis the United States in relation to the New START Treaty was the conversion by the US Air Force of 41 B-52H heavy bombers from nuclear to conventional only capability aircraft, and modifications made to the 4 launch tubes on each of the US Navy's 14 Ohio-type SSBNs rendering them unsuitable for the deployment of Trident II submarine-launched ballistic missiles (SLBMs). Throughout the verification process, Russia did not confirm that the converted B-52H bombers were indeed no longer able to carry nuclear weapons, or that the converted launch tubes on Ohio-type SSBNs could not be used for the deployment of Trident II SLBMs.

At the same time, the Russian and US sides have no claims against each other regarding the actual fulfillment by them of their obligations under the New START Treaty with regard to limiting the number of deployed and non-deployed strategic offensive arms. This definitely is the main factor indicating that the Treaty remains viable, since both parties on the established deadline – February 5, 2018 – reduced their strategic offensive arms to a level not exceeding the limit set by this Treaty.² Since then, they have strictly complied with the limitations

² According to the exchange of data between Russia and the United States on the implementation of the New START Treaty on February 5, 2018, Russia's aggregate numbers of strategic offensive arms include 527 deployed ICBMs, SLBMs, and nuclear-capable heavy bombers, for which 1444 deployed warheads were counted, as well as 779 deployed and non-deployed ICBM and SLBM launch pads, deployed and non-deployed nuclear-capable heavy bombers. The corresponding figures for the United States were 606, 1393 and 800 respectively. See New START Treaty Aggregate Numbers of Strategic Offensive Arms. Fact Sheet. Bureau of Arms Control, Verification and Compliance. February 22, 2019. Available at: <https://www.state.gov/t/avc/newstart/277439.htm>; http://www.mid.ru/ru/foreign_policy/news/-/asset_publisher/ckNonkJE02Bw/content/id/3054864.

framework established by the New START Treaty. All of the technical issues related to the procedures for conversion of nuclear delivery vehicles could be fully addressed at the expert level within the framework of the Bilateral Consultative Commission, established under the New START Treaty, and addressing these issues should not become a precondition for launching negotiations on the extension of the New START Treaty. As long as they remain within the framework of the New START Treaty, the United States cannot exploit the potential advantages that Lavrov has pointed out.

What is more alarming is that currently the Trump administration is deliberately creating uncertainty about the prospects for the New START Treaty extension. During his visit to Moscow last year, John Bolton, National Security Advisor, said that the United States had not, “set any date for negotiations on the New START Treaty.” On March 11 this year, US Under Secretary of State Andrea Thompson said that the US had not yet come to any decision regarding the Treaty. However, much more recently, on May 29 of this year, Tim Morrison, Special Assistant to the President and Head of the National Security Council, stated that the final decision on the Treaty would be taken by the President in 2020. He did not, however, provide any details on what it could be.

One can assume that by creating uncertainty over the New START Treaty Washington is trying to put additional pressure on Moscow to win concessions from Russia and make it withdraw the aforementioned claims regarding the conversion of the strategic offensive weapons that I mentioned. Although there is a possibility that the reason why the US president cannot make a decision might be linked to his administration’s internal bickering over the need to maintain the New START Treaty.

There is less and less time left for Russia and the United States on the extension of the New START. One cannot, therefore, exclude option that the two parties might not be able to come through to preserve the New START Treaty, in which case the existing nuclear arms control regime between Russia and the United States would cease to exist.

The collapse of the nuclear arms control regime that was built through the efforts of previous generations of rational leaders from the United States and the Soviet Union (or, since 1991, Russia), would create a huge risk of an uncontrolled nuclear arms race. This would not really be in the long-term national interests of either the US or Russia.

What can be done to minimize the consequences of termination of the New START Treaty?

Russia and the United States could make joint or parallel statements that they are not planning to build up arsenals of their strategic offensive arms that would exceed the limits of the New START Treaty, and in case any such plans emerge, to let the other party know about it. In this context, Russia and the United States should continue to exchange data on strategic offensive weapons (missiles, launchers, heavy bombers, deployed warheads), which could be achieved through a political agreement. Meanwhile, they also need to continue the exchange of data on strategic offensive weapons through Nuclear Risk Reduction Centers. The agreement on the establishment of these Centers was signed in 1987. It stipulates, in particular, that, “each Party also may, at its own discretion as a display of good will and with a view to building confidence, transmit through the Nuclear Risk Reduction Centers communications other than those provided for under Article 1 of this Protocol” (and in addition to those provided for in the treaties in force between them). This provision gives the Russian and US administrations transparent legal requirements with which to comply for the exchange of data in the absence of the New START Treaty.

The parties have the ability to verify the data received, albeit not to the extent provided for under the New START, with the use of national technical means of verification. However, a significant confidence-building measure could be routine on-site inspections (their nature and number per year being the subject of a future agreement). Yes, such a mechanism for nuclear arms control verification would be unprecedented for a bilateral political agreement, but it would be

based on the long and generally positive history of inspections under the framework of the politically binding multilateral agreement known as Vienna Document 2011 on Confidence- and Security-Building Measures. This experience should prove beneficial.

Russia and the United States would also have to reaffirm their commitment to the 1988 Agreement on Notifications of ICBM and SLBM Launches and the 1989 Agreement on Reciprocal Advance Notification of Major Strategic Exercises, as well as continue to exchange notifications through the Nuclear Risk Reduction Centers in accordance with these agreements.

It would also be useful to make a joint statement declaring that the open-ended 1971 US-Soviet Agreement on Measures to Reduce the Risk of Outbreak of Nuclear War and the 1973 US-Soviet Agreement on the Prevention of Nuclear War remain in force. The parties should go beyond these statements and make another joint Russian-US high-level statement on the prevention of nuclear war and strengthening of strategic stability. Such a draft joint statement that Moscow submitted to the United States in October 2018, would also prove very useful if the New START Treaty were to be maintained.

With the expiration of the New START Treaty, the Bilateral Consultative Commission – the last regular mechanism for discussing issues related to the strategic offensive and strategic defensive weapons of Russia and the United States – would also cease to exist. This would make it all the more urgent to find a forum for discussion about bilateral strategic arms issues and, more generally, about maintaining strategic stability in the absence of legal nuclear arms control regime. Moscow and Washington could establish a permanent body in the form of an intergovernmental commission on strategic stability. One attempt to do so in 2017 proved unsuccessful (a single meeting of the intergovernmental commission was held) and was negatively affected by the sharp deterioration in Russian-US relations due to political and economic sanctions imposed by the US against Russia and the tit-for-tat measures that ensued.

However, with the termination of the INF Treaty and the New START Treaty a new reality that is different from the one we have today would emerge. Therefore, if Moscow and Washington do not actually want the absence of nuclear weapons treaties to lead to a nuclear confrontation, then the abovementioned intergovernmental commission is indispensable.

Lastly, on May 3 this year, Russian President Vladimir Putin had a telephone conversation with US President Donald Trump. The media reported that the presidents discussed, among other things, both the possibility of extending the New START Treaty and negotiating a new nuclear agreement signed by the United States, Russia and China, which would cover all types of nuclear weapons. It is also alleged that the US administration has been developing a draft for such an agreement.

This is certainly a positive indication of Washington's intention to maintain nuclear arms control regime, though the conditions for the agreement remain unclear. The issue arises however as to why this US initiative does not include officially recognized nuclear powers such as the United Kingdom and France that are both US allies. It is unlikely that such an approach would be acceptable for Moscow and Beijing. For a long time, Moscow has been demonstrating its commitment to the multilateral format of arms control that would involve all nuclear weapons states. Moscow has not made any concrete proposals in this regard, and yet its position on this issue appears to remain stable.

It seems that multilateralizing nuclear arms control even within the framework of the P5 (the United States, Russia, China, the United Kingdom and France) belongs to the distant future, since the necessary military and political conditions are not yet ripe. That was demonstrated by the fact that Chinese Foreign Ministry Spokesperson Geng Shuang said at a media briefing on May 6 that China would not participate in any negotiations on an agreement with the United States and Russia on nuclear disarmament. The priority then becomes to maintain the New START Treaty.

In the event that all attempts to maintain the New START Treaty prove unfruitful, the United States and Russia should make efforts to minimize the consequences of its termination. I mentioned some possible measures in this presentation. They would not be easy to implement, and would require strong political will from the leaders of both Russia and the United States. However, it is not only appropriate but essential to try to implement these measures because failure to act would be fraught with unpredictable negative consequences not only for Russia and the United States but for all of humanity.



STRENGTHENING THE TREATY ON THE NON-PROLIFERATION OF NUCLEAR WEAPONS AHEAD OF THE 2020 REVIEW CONFERENCE

2.1. NON-PROLIFERATION IN A TIME OF TROUBLES: CAN THE NPT SURVIVE?

*Steven Miller*¹

For five decades, the non-proliferation regime has survived endless criticism, friction between nuclear haves and nuclear have-nots, failed review conferences, protracted compliance controversies, the disaffection of important groupings such as the Arab League and the Non-Aligned Movement, breaches of the non-proliferation norm, and various failings and setbacks. The regime has recurrently seemed to be imperiled. In the aftermath of the Indian and Pakistani nuclear tests in 1998, for example, Joe Cirincione observed that “a series of crises has shaken confidence in the regime” and worried that “there remains a distinct possibility of a catastrophic collapse of the regime.”² An essay in 2004 asked, “Is the NPT Regime Slowly Dying?”³ A decade later, the cover of the *Washington Quarterly* raised the same question: “Is Non-proliferation Dying?”⁴ In one of the essays in that issue, Raja Mohan observes that “Suggestions abound that

1 Steven Miller – Director, International Security Program; Editor-in-Chief, International Security; Member of the Board, Belfer Center for Science and International Affairs, John F. Kennedy School of Government, Harvard University; Ph.D. (USA).

2 Cirincione J. Historical Overview and Introduction. in *Repairing the Regime: Preventing the Spread of Weapons of Mass Destruction.*, ed. By J. Cirincione. New York: Routledge, 2000. Pp. 3, 5.

3 Miller S. Is the NPT System Slowly Dying? Seven Challenges to the Regime. in Center for Policy Analysis and Planning, *Conference on Nuclear Proliferation*. Athens, Greece: Ministry of Foreign Affairs, 2004. Pp. 45-63.

4 See the section “Is the NPT Regime Slowly Dying?” in *The Washington Quarterly*, Spring 2013, Vol. 36, No. 2.

the regime is in fundamental crisis.”⁵ The NPT has somehow endured through half a century but its health seems to be perennially in doubt and its survival seems to be perennially at risk.

Now we seem to have arrived at another time of troubles for the regime. The Trump Administration has repudiated the most ambitious and innovative supplement to the NPT ever achieved – the Joint Comprehensive Plan of Action (JCPOA) with Iran – and is instead pursuing a highly confrontational and coercive approach to non-proliferation that is rejected by much of the world, including many of America’s closest allies. Collaboration among the major powers to promote non-proliferation has been replaced by damaging disagreement, with European states (and others) actively seeking to thwart US policy in order to save the JCPOA, and Washington emphatically threatening to punish those, including friends and allies, who violate unilateral US sanctions. To date, Iran has continued to meet its obligations under the JCPOA, meaning that Tehran is positioned as the compliant party while Washington has taken on the role of agreement-wrecker, subject to international criticism.⁶ The JCPOA has so far survived the US defection, but should it collapse, the Iran crisis will reach another crescendo and the use of force is a distinct possibility. While the Iran crisis festers, still unresolved after nearly twenty years, nuclear arms control is foundering. The latest step in the protracted demolition of the arms control frameworks that have governed by far the world’s largest nuclear arsenals has been the apparent demise of the Intermediate Nuclear Forces Agreement (INF). Damaged by mutual accusations of noncompliance and undermined by changing strategic circumstances, the INF agreement has been renounced by both the United States and Russia, each of whom has announced its formal withdrawal from the treaty. Within the NPT context, this will be seen as a significant

setback, another step away from fulfilling the disarmament obligation that the nuclear weapon states (NWS) assumed under Article VI of the NPT. Contention over the perceived failure of the NWS to comply with Article VI is one of the most well-established traditions within the NPT system and will likely be as intense as ever given with wide dismay that another arms control measure has been abandoned. Destroying arms control agreements is not likely to bolster the credibility of Washington and Moscow at the 2020 NPT Review Conference.

Frustration with the performance of the NWS in moving toward nuclear disarmament found expression in the negotiation at the United Nations of the Treaty on the Prohibition of Nuclear Weapons (TPNW, also known colloquially as the Ban Treaty). The TPNW has proven to be intensely polarizing. Arising out of the Austrian-led humanitarian initiative, the drive for a ban treaty pitted those who regard nuclear weapons as undesirable, unnecessary, illegal, and immoral against those who see nuclear weapons as legitimate and important providers of deterrence, stability, and security. During the negotiation of the Treaty in the UN General Assembly, it faced unrelenting opposition from the NWS, none of whom see any merit in an agreement that directly targets the holdings of nuclear weapons that they continue to regard as necessary, if not essential, for their security (and in some cases for their international status). Nuclear-protected states in the US alliance system, nearly several dozen strong, found themselves awkwardly positioned, torn between the nuclear guarantees on which they rely and their status as non-nuclear weapon states (NNWS) with sympathies for the disarmament cause; in the end, these states refrained from voting on the treaty, though one (the Netherlands) did vote against it. On July 7, 2017, nevertheless, 122 states, some two-thirds of the international system, voted for a treaty that they knew to be utterly unacceptable to the NWS. So far, 70 states have signed the TPNW and 23 have ratified it. The Treaty will enter force after the fiftieth ratification. Even if or when the Treaty enters force, none of the nuclear weapon states will sign, meaning that the practical impact on

⁵ Mohan R. Prague as the Nonproliferation Pivot // *The Washington Quarterly*. Spring 2013. Vol. 36. No. 2. P. 110.

⁶ In late May 2019, the International Atomic Energy Agency issued its 15th report certifying Iran’s compliance with the JCPOA. See Tirone J. Iran Sticking to Nuclear Deal as EU Vies to Prevent Its Collapse // *Bloomberg*. May 31, 2019.

their nuclear postures will be nonexistent. The political effects of the TPNW, however, could be significant. Much of the international community will inhabit a parallel universe in which nuclear weapons have been legally banned, while the NWS carry on with their customary nuclear policies and postures.

Critics of the Treaty fear that this development further poisons the atmosphere between the nuclear haves and have-nots, distracts from more urgent proliferation concerns, prevents focus on less sweeping but more meaningful concrete steps to improve the NPT system, privileges infeasible long-term visions at the expense of immediate policy considerations, and puts in place a flawed legal instrument that raises unrealizable hopes.⁷ In the United States, even moderate voices share these concerns. Jon Wolfsthal, for example, has expressed the worry that the TPNW “risks doing real damage to the non-proliferation and disarmament landscape.”⁸ The ban treaty, writes Australian analyst Rod Lyon, “is probably going to create more problems than it solves.”⁹

For supporters of disarmament, in stark contrast, the TPNW has been hailed as an enormous breakthrough, reflecting the preferences of the majority within the international community, both among states and within civil society. It is seen as the tangible, legally binding, form of an increasingly powerful norm that will inevitably (if gradually) pressure the NWS to meet their disarmament obligations and to conform to global normative preferences. The hope is that nuclear weapons will be stigmatized and that the possessors of nuclear weapons will increasingly be seen as outside the norms of acceptable behavior.¹⁰ “Future historians may record summer 2017,” write ardent

ban supporters Paul Meyer and Tom Sauer, “as the beginning of the end of the nuclear age.”¹¹ Thus, the TPNW has surfaced and put into the spotlight two completely contradictory perspectives on nuclear weapons, a collision of worldviews that is very difficult to reconcile and that could have destructive consequences for the management of the non-proliferation regime.¹² Some believe that this degree of open antagonism is unprecedented. Rebecca Gibbons suggests, for example, that “the TPNW represents the deep divide over nuclear disarmament among members of the NPT. Though the NPT has weathered obstacles before, this division may be its most significant test yet.”¹³

These frictions were on full display at the third preparatory committee (PrepCom) meeting for the 2020 NPT Review Conference in New York in May 2019. Marked by acrimony and disagreement, the PrepCom failed to reach substantive recommendations and revealed the dissatisfaction of many with the “abysmal” record of the NWS – above all, there was criticism of the United States for its role in wrecking the JCPOA and the INF agreement.¹⁴ More generally, the waning of US-Russian arms control produced discontent and worry.¹⁵ There was wide enthusiasm for the TPNW but continued opposition from the NWS (including “strident denunciations” by France).¹⁶ The US delegation criticized the draft document of recommendations prepared by the Chairman of the PrepCom and then condemned the second draft as “dramatically worse.” As has so often been true in the NPT context, consensus is necessary but impossible to achieve.

11 Meyer P., Sauer T. The Nuclear Ban Treaty: A Sign of Global Impatience // *Survival*. 2018. Vol. 60, No. 2. P. 61.

12 On the distance between supporters and opponents of the TPNW and their degree of mutual incomprehension, see Williams H. A Nuclear Babel: Narratives Around the Treaty on the Prohibition of Nuclear Weapons // *The Nonproliferation Review*. 2018. Vol. 25, No. 1-2. Pp. 51-63.

13 Gibbons R. Addressing the Nuclear Ban Treaty // *The Washington Quarterly*. 2019. Vol. 42, No. 1. P. 28.

14 For an informative account of the third preparatory committee meeting, see Johnson R. Will Non-Proliferation and Nuclear Restraint Be Weakened in 2020? *European Leadership Network*. May 24, 2019. It is Johnson who dubs the record of the NWS as abysmal.

15 See, for example, The INF Treaty and New START Crisis and the Future of the NPT: Statement of NGO Representatives and Experts to the 2019 NPT Prep Com for the 2020 review Conference. *Arms Control Association*. May 1, 2019.

16 Ibid.

7 For a particularly influential critique of the ban treaty, see Roberts. B. Ban the Bomb or Bomb the Ban? Next Steps on the Ban Treaty. *European Leadership Network Policy Brief*. March 2018. Roberts concludes (p. 9) that the impact of the TPNW “could be far-reaching and dangerous. For a response, see Sauer T. Whether You Like It or Not, The Ban Treaty is Here to Stay: A Reply to Brad Roberts. *European Leadership Network*. March 29, 2018.

8 Wolfsthal J. Second Time Is Not a Charm for the Nuclear Ban Treaty. *Arms Control Wonk*. June 29, 2017.

9 Lyon R. The Nuclear Ban Cometh, Unfortunately // *Australian Outlook*. Australian Institute of International Affairs. July 6, 2017.

10 See, for example, Sauer T., Reveraert M. The Potential Stigmatizing Effect of the Treaty on the Prohibition of Nuclear Weapons // *The Nonproliferation Review*. 2018. Vol. 25. Pp. 437-455.

So the battle lines are clearly drawn for what looks to be the next bruising phase of NPT diplomacy. Particularly given the brash and outspoken presence of US National Security Advisor John Bolton, the contours of the situation bring to mind the 2005 NPT Review Conference, a spectacular failure in which Bolton had a major role as a senior figure in the Bush Administration. The 2005 Conference struggled even to agree on an agenda, much less a substantive final document, in no small part because the Bush Administration insisted that the United States should be exempt from scrutiny.¹⁷ Colliding preferences, unresolved crises, intractable issues, mounting mutual frustrations, and an assertive American administration more than willing to stand alone against substantial international opposition – the ingredients are in place for a difficult, friction-laden 2020 NPT Review Conference, and the likelihood of another disappointing failure seems high. Once again, we may witness the spectacle of one of the world’s most significant arms control regimes unable to find diplomatic accommodations that allow it to function smoothly and effectively.

How much does this matter? Is this simply business as usual for the NPT regime – the latest in a fifty-year pattern of discontent and vexation – or is this something different, a more profound crisis that raises existential questions for the regime?¹⁸ Will 2020 be just another in a routine string of failed review conferences or will acute discord jeopardize the future of the regime? Pessimists worry that sentiment against and pressure on the regime is cumulative and has mounted to dangerous levels, that the current divisions are deeper, the problems more fundamental and possibly less fixable, the recalcitrance of the NWS has become less and less tolerable. As one recent analysis comments, in the current environment, “the resilience of the NPT will be tested as never before, which may have irreversible and highly

undesirable consequences.”¹⁹ Some believe that the collapse of the regime is in view.²⁰ Another analysis sees the NPT “at risk of crumbling” and fears that “it could be damaged beyond repair.”²¹ If the pessimists are correct, the NPT regime may be terminally ill and some sort of catastrophic, regime destroying crisis could loom ahead.

History suggests, however, that the NPT system will withstand whatever batterings it takes in the coming period, just as it has endured all past crises and difficulties. Over the history of the regime, the diplomacy of the NPT has been bedeviled by a familiar set of recurrent grievances. Disputes about the Article VI disarmament obligations of the nuclear-armed states date to the first NPT Review Conference in 1975. Frustration over the disappointing pace of progress in superpower arms control was a controversial and paralyzing issue at the second Review Conference in 1980.²² Complaints about the increasingly restrictive technology denial regime imposed by the nuclear suppliers have been issued repeatedly by the Non-Aligned Movement, which believes that its Article IV rights to nuclear technology are being unacceptably abridged. There has been regular dissatisfaction, voiced from different quarters for different reasons, over the inability of the regime to hold transgressors accountable, whether criticism from the West over cases like Iran and North Korea or reproach from NNWS over the ongoing disregard by the NWS of their disarmament obligations under Article VI. These are, it might be said, the standard portfolio of troubles for the NPT regime. The current roster of problems – the assault on the JCPOA, the demise of the INF agreement, the emergence of the TPNW – represent just the latest versions of longstanding disputes. Is the withdrawal from INF really more damaging to the NPT than the

17 See, for example, Johnson R. Politics and Protection: Why the 2005 NPT Review Conference Failed. Acronym Institute for Disarmament Diplomacy. November 1, 2005.

18 On the protracted structure of disagreement in the NPT regime, see Miller S. Nuclear Collisions: Discord, Reform, and the Nonproliferation Regime. Cambridge: American Academy of Arts and Sciences, 2012.

19 Durkalec J. The Nuclear Nonproliferation Treaty at Fifty: A Midlife Crisis. NATO Review. June 26, 2018.

20 See, for example: Acheson R. and Pytlak A. The Nuclear-Armed States are Creating the Conditions for NPT Collapse. European Leadership Network. May 29, 2018.

21 Varriale C. The UK Should Lead the Way to a Successful 2020 NPT Review Conference. European Leadership Network. June 4, 2018.

22 On the early origins of these disputes, see Miller S. Proliferation, Disarmament, and the Future of the Nonproliferation Treaty. In *Nuclear Proliferation and International Security*, ed by M. Maerli, S. Lodgaard. New York: Routledge, 2007. Pp. 50-70.

Carter Administration's refusal to ratify SALT II after the Soviet invasion of Afghanistan in 1979 (thereby stymying arms control and contributing to controversy at the 1980 Review Conference) or the Bush Administration's withdrawal from the ABM Treaty in 2002 (thereby flagrantly transgressing one of the 13 arms control steps agreed at the 2000 Review Conference and eliminating what was widely regarded as the cornerstone of strategic arms control)? Is Trump's rejection of the JCPOA more disruptive than Bush's 2003 preventive attack on Iraq, aimed at Saddam Hussein's alleged (but it turned out nonexistent) nuclear weapons and other weapons of mass destruction, producing a costly and protracted war that was widely regarded as both unnecessary and unlawful? Are the issues raised by the TPNW somehow more lethal than fights over Article VI during the Cold War, when the intense competition between the Soviet Union and the United States produced a combined accumulation of nearly 70,000 nuclear weapons by the mid-1980s – more than five times their present inventories? In short, the latest troubling developments do not seem more threatening or more likely to be fatal than earlier crises that the NPT has endured.

If the challenges to the NPT regime seem no more severe than in the past, perhaps the problem is that the NPT regime has become more vulnerable, less able to survive the ceaseless cycle of discord, discontent, and disagreement that have marked its history. The NPT regime has been resilient enough to overcome previous trials and disputes, but will this remain true in current circumstances? Are there grounds for thinking the NPT has grown less resilient? While there are always worrisome factors in the picture, it seems that the sources of resilience remain in place.

At the most fundamental level, it appears that the overwhelming majority of states have judged that their interests are best served by remaining non-nuclear. Joining the NPT is a choice; states have the option of remaining outside the treaty, as a number of states did for extended periods of time. Some notable countries – for example,

Argentina, Brazil, China, Cuba, South Africa and the United Arab Emirates – waited two decades or more after the NPT entered force in 1970 before joining the treaty. Indeed, 51 states have entered the NPT since 1990. In some cases, NPT ratification occurred only after protracted periods of serious debate, suggesting that the decision to give up the nuclear weapons option and instead join the NPT was carefully considered and deliberate – as was true, for example, in Japan and Sweden.²³ Only three states – Israel, India, and Pakistan – have failed to sign the NPT. Hence, as is often remarked, the NPT has become nearly universal, with 190 members. Every NNWS in the international system, with the single exception of South Sudan, is a signatory of the NPT. As indicated by the case of North Korea, even a small, poor, weak, isolated state can acquire nuclear weapons if it is committed to do so, which suggests that most UN members are capable of developing a nuclear weapons capability given a decision to go down that path. Remarkably, 95% of states in the international system have chosen to forsake nuclear weapons – and far from shrinking, membership in the NPT has gradually expanded to encompass the almost the entire international system.

Just as joining the NPT is a volitional decision by sovereign states, so too is remaining in the NPT. Article X.1 gives parties to the treaty “the right to withdraw” if the state itself decides that its “supreme interests” have been jeopardized. All that is required is notification three months in advance, including a statement that explains the grounds for withdrawal. This permissive clause leaves withdrawal entirely in the hands of the member state; there is no adjudicatory body that must rule on the withdrawal claim, nor is approval required. Thus, disaffected parties can easily exit the treaty. There have been occasional threats to withdraw or concerns that states might withdraw. The 22-member Arab League, angered by what it sees as favorable discriminatory treatment of Israel and

²³ On Japan, see Endicott J. The 1975-76 Debate Over Ratification of the NPT in Japan // *Asian Survey*. March 1977. Vol. 17, No. 3. Pp. 275-292. On Sweden, which terminated a nuclear weapons program to sign the NPT, see Van Dassen L. Sweden and the Making of Nuclear Nonproliferation: From Indecision to Assertiveness. SKI Report 98-16, Swedish Nuclear Power Inspectorate. March 1997.

exasperated by the failure to convene a much-promised conference on WMD in the Middle East, has invoked the withdrawal threat – but without ever following through.²⁴ At various moments during the protracted crisis over Iran’s nuclear program, Tehran has suggested that it could withdraw from the NPT in response to the pressures and punishments it was experiencing.²⁵ When the Trump Administration escalated its policy of “maximum pressure” against Iran in the spring of 2019, Iran’s Foreign Minister Javad Zarif once again raised this possibility (threat), suggesting that harsh American policy could drive Iran out of the regime.²⁶ Clearly, withdrawal is a risk that cannot be entirely discounted. But in the entire history of the NPT, only one state has exercised the right to withdraw – North Korea in January 2003, in response to mounting pressure from the United States. If truly mortal threats to the NPT regime existed, it would be reasonable to expect withdrawal to be frequently invoked and exercised and there ought to be any number of parties that have withdrawn or that are seriously considering doing so. But this has never been the case. Thus, with respect to both joining and remaining in the NPT, the overwhelming majority of states have been remarkably committed to this legal instrument. This is a heartening baseline for considering the impact of the current contentious issues on the NPT agenda.

But will this remain the case? It would be a severe threat to the NPT if this nearly universal preference for a non-nuclear world began to change as a result of dissatisfaction with the regime. It would not be surprising if at least some states were to rethink their position given that the states that do possess nuclear weapons are insistent that these weapons are uniquely valuable. Some of the most powerful international actors ever to exist believe that nuclear weapons are a necessary element of their defense posture. The US National

24 See, for example, Arab League Vows to Drop Out of NPT if Israel Admits It has Nuclear Weapons // Haaretz. March 5, 2008.

25 See, for example, Peel M., Barker A., Bozorgmehr N. Iran Threatens to Withdraw from Nuclear Proliferation Treaty // Financial Times. May 25, 2018. On the implications of an Iranian withdrawal, see: Scheinman A. What If Iran Leaves the NPT? // Bulletin of Atomic Scientists. June 8, 2018.

26 Iran Says Leaving Nuclear Treaty One of Many Options After US Sanctions Move // Reuters. April 28, 2019.

Security Strategy, for example, says that nuclear weapons serve “a vital purpose” as the “foundation” of US strategy.²⁷ The NATO Strategic Concept describes nuclear weapons as “the supreme guarantee” of alliance security.²⁸ If nuclear weapons are so valuable to some of the most powerful international actors that have ever existed, why would they not be tempting and useful for smaller, weaker players? This chain of thinking leads to the puzzle on which the NPT rests: why, then, have so many states opted to set aside the nuclear weapon option and remain non-nuclear? And in judging the gravity of the current situation, it is necessary to ask: Are the reasons for rejecting the nuclear weapons option weakening? If so, this could explain why there is concern that the current challenges to the regime could be life threatening. Obviously, every state makes its own decision about the pros and cons of nuclear acquisition, so there are 184 unique stories about why states made the choices that they did. However, it is possible to describe a composite of factors that many have influenced decisions to give up the nuclear weapons option. Why are there so many nonnuclear members of the NPT?

Limited utility of nuclear weapons

Nuclear weapons are so destructive that they are disproportionate to most security problems and the threshold for use is so high that they are not applicable in most conflict scenarios. The United States lost – or at least did not win – three wars (Korea, Vietnam, and Iraq) without resort to nuclear weapons. Even in the most desperate moments of the Korean War in August and September of 1950, Washington decided not to use nuclear weapons – though at that point the only precedent was not restraint but nuclear-use and the United States still possessed something close to a nuclear monopoly in terms of operational capability.²⁹ Israel is thought to have possessed a

27 National Security Strategy of the United States of America. Washington DC. December 2017. P. 30.

28 NATO, Active Engagement, Modern Defence: Strategic Concept for the Defense and Security of Members of the North Atlantic Treaty Organization. November 2010. P. 14.

29 For discussion of this issue, see: Farley R. Win the Korean War By Dropping Nuclear Weapons on

nuclear capability for some 50 years, but this has not protected it from repeated attacks and sustained campaigns of terrorism, nor has it allowed Israel to feel secure in its region. The Soviet Union amassed the world's largest nuclear arsenal but this did not save it from catastrophic state collapse. In short, it has long been clear, on the basis of abundant evidence, that nuclear weapons are not a magic solution to the security problems of states; mostly they appear to be insurance policies against unlikely extreme contingencies. As Robert McNamara concluded in one of his most important speeches as Secretary of Defense in the 1960s, nuclear weapons have "proven to be a limited diplomatic instrument" and they play "an intrinsically limited role" in US and allied security.³⁰ Most states face limited security problems – border disputes, terrorism, insurgencies, etc. – for which nuclear weapons do not appear to be relevant. It could be that many states recognize that the acquisition of nuclear weapons may not be that useful in their security context.³¹ As John Mueller has written, nuclear weapons "have proved useless militarily... Few states have or want them."³²

Unusable weapons?

On the occasion of receiving the Nobel Prize in Economics, Thomas Schelling devoted his Nobel Lecture to what he described as "the most spectacular event of the past sixty years": the non-use of nuclear weapons. This outcome he attributed largely to an "abhorrence" of nuclear weapons, to the "universal revulsion" against them, and he attached enormous importance to what he described as "the accumulating weight of tradition against nuclear use."³³ Schelling was

China? // *The National Interest*. July 29, 2018.

30 Alexei Arbatov has drawn attention to McNamara's early thinking in his important article, *Mad Momentum Redux? The Rise and Fall of Nuclear Arms Control* // *Survival*. 2019. Vol. 61, No. 3.

31 The most outspoken champion of the view that nuclear weapons have limited value is John Mueller. See his *The Essential Irrelevance of Nuclear Weapons: Stability in the Postwar World* // *International Security*. 1988. Vol. 13, No. 2. Pp. 55-79.

32 Mueller J. Nuclear Weapons Don't Matter: But Nuclear Hysteria Does // *Foreign Affairs*. November-December 2018.

33 Schelling T. An Astonishing Sixty Years: The Legacy of Hiroshima. Nobel Prize Lecture. December 8,

adding his voice to a body of thought that identifies the existence of a powerful nuclear taboo – a normative barrier to the actual use of nuclear weapons. In her important work on the taboo, Nina Tannenwald explains, "a normative prohibition on nuclear use has developed in the global system which... has stigmatized nuclear weapons as unacceptable weapons of mass destruction."³⁴ This taboo has come to be widely accepted. As Tannenwald elaborates, "the nuclear taboo has been embraced by the United Nations and by leaders and publics around the world as a norm of international politics."³⁵ The opprobrium associated with nuclear weapons derives, of course, from the horrible, almost unimaginable, human cost that they would inflict if used. In recent years, there has been, if anything, increased attention to this fact as a result of efforts to apply international humanitarian law to nuclear weapons and as a result of the associated series of several conferences – dubbed the humanitarian initiative – devoted to exploring what the final document of the 2010 NPT Review Conference described as "the catastrophic humanitarian consequences of any use of nuclear weapons."³⁶ There has been increasing acceptance of the view that nuclear use simply cannot be reconciled to international humanitarian law, reinforcing the case for regarding nuclear weapons as abhorrent and unusable.³⁷ The taboo may not be universally accepted and it is not an impermeable barrier to the use of nuclear weapons. Moreover, it can be threatened by policies of and behavior by the NWS – as is arguably

2005. Available at <https://www.nobelprize.org/uploads/2018/06/schelling-lecture.pdf>.

34 Tannenwald N. *The Nuclear Taboo: The United States and the Normative Basis of Nuclear Non-Use* // *International Organization*. 1999. Vol 53, No. 3. P. 433. See also Tannenwald N. *The Nuclear Taboo: The United States and the Non-Use of Nuclear Weapons Since 1945*. Cambridge: Cambridge University Press, 2009.

35 Tannenwald N. How Strong is the Nuclear Taboo Today? // *The Washington Quarterly*. Fall 2018. Vol. 41, No. 3. P. 89.

36 As quoted in Nystuen G., Egeland K. A 'Legal Gap'? Nuclear Weapons Under International Law // *Arms Control Today*. March 2016. For an overview of the origins and early evolution of the Humanitarian Initiative, see Williams H., Lewis P., Aghlani S. *The Humanitarian Impacts of Nuclear Weapons Initiative: The Big Tent in Disarmament*. International Security Research Paper, Chatham House, The Royal Institute of International Affairs. March 2015.

37 For a detailed legal argument on this point, see Moxley C., Burroughs J., Granoff J. *Nuclear Weapons and Compliance with International Humanitarian Law and the Nuclear Non-Proliferation Treaty* // *Fordham International Law Journal*. 2011. Vol. 34, No. 4. Pp. 595-696.

the case today with the bellicose policies of the Trump Administration. Nevertheless, there is a tradition of more than seven decades that since 1945 no state has used nuclear weapons under any circumstances, no matter how extreme. For states contemplating nuclear weapons, it is reasonable to presume that not only are these weapons of limited utility, but they are unusable. As Tannenwald notes, “a taboo reduces the value of nuclear arms.”³⁸

These two points – limited utility and unusability – seem fundamental to judgments that the acquisition of nuclear weapons is not in the interests of a state. But other considerations can reinforce the case against nuclear weapons in states considering nuclear acquisition:

A non-proliferation norm

The norm of non-use reduces the value of nuclear weapons but the norm of non-proliferation leans against the possession of nuclear weapons in the first place.³⁹ With the nearly universal commitment to the NPT, the overwhelming majority of the international community has made a legal investment in this norm and defying it puts the proliferator outside the mainstream and subject to potential pressure and punishment. The goal of stigmatizing nuclear weapons – now associated with the TPNW – has as an inevitable corollary that those who hold or seek nuclear weapons will be stigmatized. This may be an inhibition to those tempted by nuclear weapons – but the more important point is that most states are committed to the norm and hence are unlikely to fatally undermine the regime.

A costly decision

A state will presumably need to conclude that the benefits of nuclear acquisition exceed the costs if acquisition is to seem sensible and desirable. As noted, a case can be made that the benefits are

likely to be limited. But on the other side of the equation, the costs can be considerable. Two sets of costs are relevant. One has to do with the political and economic costs of attempting to acquire nuclear weapons – a path that is at odds with the preference of many other states. In particular, a number of powerful states – not least the United States – seek in a sense to enforce the regime by imposing costs on states that move to violate the non-proliferation norm. For states that have poor relations with regime enforcers, the costs can be punishingly high. It is hard to imagine what set of decision-makers will look at the experience of Iran or North Korea over the past 20 years and see that as an easy or desirable path. Certainly, it has been a very costly path in multiple respects – including serious economic damage and impaired ability to operate diplomatically. But the United States has pressured even its formal allies when they deviated from the non-proliferation path, threatening to withdraw security guarantees or otherwise inflict costs if nuclear ambitions were not abandoned.

The second set of costs relates to the direct budgetary expense of acquiring nuclear weapons. It is often said that nuclear weapons are not expensive – and they were in fact affordable even for an impoverished state like North Korea or a very small state like Israel. But nuclear weapons are most readily affordable by large, relatively wealthy states that spend large sums on defense. Most states fall outside that category. Furthermore, one of the purposes of the non-proliferation regime is to make acquisition slow, difficult, and as expensive as possible. Hence, nuclear acquisition, while in some sense affordable, would represent a substantial burden on the defense expenditures of most states. Since the resources for defense are always finite, this could produce a trade-off between nuclear weapons and conventional capabilities, between weapons that may be unusable in almost all circumstances and assets that are applicable to the day-to-day security challenges – internal and external – that are faced by the state.

³⁸ Tannenwald N. How Strong is the Nuclear Taboo Today?... P. 93.

³⁹ For an interesting discussion of nonproliferation as a norm, see Freedman L. Disarmament and other Nuclear Norms // The Washington Quarterly. Spring 2013. Vol. 36, No. 2. Pp. 93-108.

Reciprocal acquisition

In May 1998, India tested nuclear weapons and Pakistan followed suit within weeks. Israel is thought to have acquired nuclear weapons by around 1970, and in the intervening decades it has had to worry about and work to thwart the nuclear aspirations of one regional rival after another – Iraq, Syria, Iran. Additional worries may lie ahead for Israel as nuclear technology spreads throughout the Middle East and countries such as Saudi Arabia, Egypt and Turkey develop civilian nuclear sectors that could whet their weapons appetites. As these illustrations suggest, one possible, perhaps even likely, consequence of nuclear acquisition is that nearby rivals will also seek nuclear weapons. It would be reasonable for decision-makers to conclude that, from the perspective of national security, the nonnuclear alternative is preferable to the nuclearization of the neighborhood. One advantage of nuclear dangers is that they are easily understood.

There are other factors that could weigh against a decision to acquire nuclear weapons. The technology denial regime presently in place makes the pursuit of nuclear weapons slow and difficult, and possibly involving a dangerous transition phase. Some states – those several dozen in the US nuclear protectorate – can opt for nuclear weapons only at the expense of existing nuclear guarantees. Many states are likely to be reluctant to defy the great power enforcers of the regime – because such defiance, as noted, can produce enormous costs. Those states – for example, in Europe – that are committed to the rules-based international order may also be swayed by legal findings that hold that nuclear weapons are generally contrary to international law. There is an accumulation of considerations that could weigh against a decision to choose nuclear weapons.

In sum, it is arguable that for most states, nuclear acquisition represents a high cost, limited benefit option. This negative balance in the cost-benefit equation is possibly reinforced by Schelling's normative abhorrence of nuclear weapons. This must be at least part of the explanation for why the vast majority of states are NNWS members of the NPT.

A new set of troubles has pressed onto the international nuclear agenda. The erosion of arms control – most recently the rejection by Washington of the JCPOA and the demise of INF – is a disappointment to much of the international community and is sure to produce discontent in the NPT context. The polarization reflected in the Ban Treaty – with much of the world moving to prohibit nuclear weapons while a group of nine states retains and relies on those weapons – is likely to result in recurrent collisions of irreconcilable worldviews. Friction seems unavoidable and NPT Review Conferences held in such conditions are bound to encounter difficulties. It will be no surprise if the 2020 Review Conference (like some in the past) fails to achieve progress or even basic outcomes like a consensus document. This is unfortunate and will produce contentious NPT politics but does not necessarily cause existential trauma to the NPT system. The NPT has weathered serious storms in the past and the current controversies do not seem more threatening than in previous troubled phases. The NPT has proven to be resilient and the sources of that resilience continue to exist. Above all, the overwhelming majority of states have chosen the non-nuclear path and appear to prefer the universalization of that choice. What has been evident in recent years is not efforts to undermine or deconstruct the NPT but rather a push – supported so far by 122 states – to add an additional legal barrier to the acquisition and possession of nuclear weapons, in the form of the TPNW. We can hope that, as in the past, the substantial international sentiment against nuclear weapons will suffice to allow the NPT to muddle through its latest complications. Thus, the common state of the NPT regime: imperfect but invaluable, troubled but durable.

2.2. THE 2020 NPT REVIEW CONFERENCE AND THE TPNW FACTOR

John Carlson¹

The 2020 Review Conference for the Nuclear Non-Proliferation Treaty (NPT) will mark the Treaty's 50th anniversary. This Review Conference comes at a time of growing concern about a new arms race and the risk of nuclear war – a situation which has led to increasing contention within the NPT membership over the failure of the nuclear-weapon states to pursue the Treaty's disarmament obligations. This is bound to be a major focus at the Review Conference.

The NPT is the cornerstone of the global nuclear non-proliferation regime and the essential foundation for the pursuit of nuclear disarmament. The non-proliferation aspects of the regime have been a major success to date, but the same cannot be said for nuclear disarmament. The lack of progress on disarmament prompted the Humanitarian Initiative², highlighting the catastrophic consequences of the use of nuclear weapons. This in turn led to the conclusion of the Treaty on the Prohibition of Nuclear Weapons (TPNW). At the time of writing this paper the TPNW was not yet in force.

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² Vienna Conference on the Humanitarian Impact of Nuclear Weapons. Federal Republic of Austria. Available at: <https://www.bmeia.gv.at/en/european-foreign-policy/disarmament/weapons-of-mass-destruction/nuclear-weapons/vienna-conference-on-the-humanitarian-impact-of-nuclear-weapons/>.

The TPNW proponents intend the Treaty to complement the NPT. The two treaties have the same overall objective, the elimination of nuclear weapons, but they take radically different approaches. The NPT envisages a stepwise or incremental approach. The TPNW seeks to force the pace of disarmament by prohibiting nuclear weapons outright. The prohibitionist approach has been rejected by all the nuclear-armed states.

Because of the near-universality of the NPT, the states supporting the TPNW are all NPT parties. Thus the two treaties have members in common. It is not clear what implications this may have for the NPT Review Conference. Will there be a TPNW bloc within the review conference? Regrettably the emergence of a new treaty without the participation of the nuclear-weapon states serves to emphasise the divide between those with and without nuclear weapons. It is imperative that the TPNW does in fact complement the NPT – it is incumbent on TPNW supporters to do everything they can to avoid any adverse impact on the NPT. If the NPT is weakened then the entire international community will be the loser.

Nuclear weapons – brief overview

There are nine nuclear-armed states: five that existed when the NPT was negotiated and are recognised by the treaty as *nuclear-weapon states*, namely, the United States, Russia, the United Kingdom, France and China; and four outside the NPT, namely, India, Israel and Pakistan, which never joined the NPT, and North Korea which joined the NPT in 1985 but announced its withdrawal in 2003.

Today globally there are over 15,000 nuclear weapons. While this is a substantial reduction from the peak of over 70,000 in the Cold War, it is still enough to destroy the world several times over, and is well in excess of the numbers required for any rational concept of credible deterrence.³ Over 90% of these weapons (around 14,000) are held by the

³ See, for example, The Effects of Nuclear War. The US Office of Technology Assessment. May 1979. Available at: <http://atomicarchive.com/Docs/pdfs/7906.pdf>; and Blair B. Testimony to House Armed

United States and Russia between them, and the remaining 1,000 plus are held among the other seven nuclear-armed states.⁴

The NPT – emphasis on non-proliferation

The NPT was concluded in 1968 and entered into force in 1970. Today, with 191 parties, it is the most universal of all treaties. The NPT has three fundamental “pillars”:

1. Non-proliferation: *non-nuclear-weapon states* (NNWS) undertake not to seek or acquire nuclear weapons (Article II). They are required to conclude agreements with the International Atomic Energy Agency (IAEA) accepting safeguards on all their nuclear material to verify compliance with their non-proliferation commitment (Article III.1);
2. Disarmament: the *nuclear-weapon states* (NWS), and all the other NPT parties, undertake
... 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. (Article VI);
3. Peaceful uses: parties have an *inalienable right* to use nuclear energy for peaceful purposes, and undertake to cooperate in the peaceful uses of nuclear energy (Article IV). For the NNWS the use of nuclear energy is subject to IAEA safeguards.

Since the NPT entered force most attention has been focused on its non-proliferation provisions, together with the closely related provisions on peaceful use. The non-proliferation regime has been remarkably successful in slowing *horizontal* proliferation, that is, the spread of

nuclear weapons to further states. Prior to the negotiation of the NPT it had been predicted that by the 1990s there would be 25-30 nuclear armed states. Today there are nine: nine too many, but a far better situation than the pre-NPT predictions.

This success is due to a number of factors, particularly the effectiveness of the IAEA safeguards system and the near-universal uptake of *comprehensive safeguards* under the NPT, that is, safeguards that apply to all of a state’s nuclear material and activities. Obviously comprehensive safeguards do not apply in the nine nuclear-armed states, but they do apply in all of the other 62 states that currently have significant nuclear activities. All of these states are NNWS party to the NPT.

*Non-proliferation and nuclear disarmament
are inextricably linked*

The objective of non-proliferation, stopping the spread of nuclear weapons to further states, is not only essential in itself, but makes an essential contribution to establishing the circumstances under which nuclear disarmament can proceed. Nuclear disarmament requires a stable strategic environment where the nuclear-armed states have confidence, not only that the other nuclear-armed states will honour their treaty commitments, but that non-nuclear-weapon states will do likewise: in other words, that no new nuclear-armed states will emerge.

Disarmament – an unfulfilled commitment

Despite the obligation to pursue nuclear arms control and disarmament, since the conclusion of the NPT there have been no multilateral negotiations on nuclear arms reductions, and no negotiations seriously addressing how to achieve nuclear disarmament. The nuclear-weapon states have not shown any commitment to a diminishing role for nuclear weapons and their eventual elimination. On the contrary, it seems they expect indefinite retention of nuclear weapons and a continuing role for nuclear weapons in their national security policies.

Services Committee Hearing on Outside Perspectives on Nuclear Deterrence Policy and Posture. March 6, 2019. Available at: <https://qz.com/1566325/bruce-blair-says-trumps-nuclear-policy-could-get-us-all-killed/?utm>.

⁴ Kristensen H., Norris R., Status of World Nuclear Forces. Federation of American Scientists. June 2018. Available at: <https://fas.org/issues/nuclear-weapons/status-world-nuclear-forces/>; Nuclear Weapons: Who Has What at a Glance. Arms Control Association. June 2018. Available at: <https://www.armscontrol.org/factsheets/Nuclearweaponswhohaswhat>.

In recent times the situation has deteriorated. The principal arms control agreement between the United States and Russia, New START, is due to expire in early 2021. The United States has not yet agreed to the extension of New START, and currently no negotiations are in hand for a successor agreement. Worse still, nuclear arsenals are being upgraded, military planners are considering new uses for nuclear weapons, and political leaders are even threatening use of nuclear weapons. Scenarios for “limited” nuclear wars are being mooted.

Critics point to the lack of specificity in Article VI of the NPT. However, the drafters of the NPT recognised that nuclear disarmament would take many years and a series of agreements to achieve. In the 1960s, when the NPT was negotiated there was no prospect of reaching agreement on all the complexities involved. Accordingly, the NPT left the details of arms reduction and disarmament measures to subsequent negotiations.

Some NWS representatives have asserted that the Article VI obligation to pursue disarmament negotiations is limited, requiring only that negotiations are held. This is a misrepresentation of the NPT. The division between NWS and NNWS was never intended to be permanent: the NPT envisages that ultimately all the treaty parties will be NNWS.

The interpretation of Article VI was considered by the International Court of Justice (ICJ) in its 1996 advisory opinion on the legality of the threat or use of nuclear weapons. The ICJ concluded unanimously that Article VI is not only an obligation to pursue negotiations in good faith, but an obligation to bring these negotiations to an effective outcome, *leading to nuclear disarmament in all its aspects under strict and effective international control*.⁵

By failing to meet their obligation to pursue disarmament the NWS are not only prompting negative sentiment about the NPT, they are ignoring the very real dangers that nuclear weapons present to their own populations and to the world as a whole.

⁵ International Court of Justice Advisory Opinion on the Legality of the Threat or Use of Nuclear Weapons. 1996. Paragraph 105.F.

Treaty on the Prohibition of Nuclear Weapons

As will be discussed, the TPNW has attracted considerable criticism, some of which could have been avoided by more informed drafting. However, the treaty is important as an expression of the humanitarian objection to nuclear weapons, and it will contribute towards the delegitimization of these weapons.

The TPNW was opened for signature on September 20, 2017. The treaty will enter into force when it has been ratified by 50 states. At the time of writing, 23 states had ratified the treaty and 47 states had signed but not yet ratified.⁶

The TPNW prohibits parties, *inter alia*, producing, possessing, testing, deploying, stationing and using nuclear weapons (Article 1.1). States with nuclear weapons that join the treaty are required to remove them from operational status immediately, and to destroy them within a deadline to be set by the first Meeting of States Parties (Article 4.2).⁷

The TPNW also prohibits parties from *assisting, encouraging or inducing* anyone to engage in any activity prohibited to a party under the treaty (Article 1.1(e)). This appears to prohibit parties from accepting *extended nuclear deterrence* from a nuclear-armed state. In other words, the TPNW excludes so-called *nuclear umbrella* states from joining, unless they renounce alliance arrangements that involve nuclear weapons.

Regrettably the approach taken with the TPNW has polarised the international community.⁸ All nine nuclear-armed states and most of their allies, totaling some 40 states, have rejected the prohibitionist

⁶ The status of the TPNW can be found at https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVI-9&chapter=26&clang=_en (accessed June 9, 2019).

⁷ It is not clear whether this deadline will be a generic time period (like “within 10 years”) or a specific date (like “by 2025”).

⁸ The author’s previous paper on this subject for the International Luxembourg Forum argued for an inclusive, collaborative approach, focusing on the principle of no nuclear war rather than prohibition of possession, see Carlson J. Nuclear War Must Never Be Fought: The Need for a New Global Consensus. In *Revitalizing Nuclear Arms Control and Non-Proliferation*. National Institute of Corporate Reform. 2017. Available at: http://www.luxembourgforum.org/media/documents/Revitalizing_Nuclear_Arms_Control_and_Non-Proliferation-Moscow-2017.pdf.

approach and maintain that nuclear reductions are achievable only through a careful step-by-step approach.

In addition to the prohibitions the TPNW contains a number of other provisions which are problematic for many states.⁹ Particularly concerning are the provisions on IAEA safeguards, especially those relating to the Additional Protocol for strengthened safeguards. The IAEA Director General has emphasised that without the Additional Protocol the IAEA is unable to conclude that all nuclear material in a state has remained in peaceful activities.¹⁰

The 2010 NPT Review Conference concluded unanimously that in a nuclear-free world the Additional Protocol should be in force for all states.¹¹ However, the TPNW contradicts this by mandating an Additional Protocol only for ex-weapons states but not for NNWS.¹² Yet, as the 2010 Review Conference recognised, the universal application of the highest safeguards standard is essential to achieving and maintaining a nuclear-weapon-free world. It is not clear how, in the negotiation of the TPNW text, a few Additional Protocol holdout states were able to prevail over the great majority that support the Additional Protocol. This outcome could have been avoided by a more considered approach to drafting.

⁹ For critiques of the TPNW see, for example, Inquiry into the Consequences of a Swedish Accession to the Treaty on the Prohibition of Nuclear Weapons. Swedish Ministry for Foreign Affairs. January 2019. Available at: https://www.regeringen.se/48f047/contentassets/55e89d0a4d8c4768a0cabf4c3314aab3/rapport_l-e_lundin_webb.pdf; Review of the consequences for Norway of ratifying the Treaty on the Prohibition of Nuclear Weapons. Norwegian Foreign Ministry. November 28, 2018. Available at: https://www.regjeringen.no/en/dokumenter/review_tpnw/id2614520/; Report of the Working Group to Analyse the Treaty on the Prohibition of Nuclear Weapons. Swiss Federal Department of Foreign Affairs. June 30, 2018. Available at: www.eda.admin.ch/dam/eda/en/documents/aussenpolitik/sicherheitspolitik/2018-bericht-arbeitsgruppe-uno-TPNW_en.pdf; Carlson J. The Nuclear Weapons Prohibition Treaty: Aim, Scope and Limitations, APLN (Asia Pacific Leadership Network). July 2017. Available at: http://a-pln.org/briefings/briefings_view/Policy_Brief_No_42_-_The_Nuclear_Weapons_Prohibition_Treaty:_Aim,_Scope_and_Limitations?ckattempt=2.

¹⁰ Challenges in Nuclear Verification. Center for Strategic and International Studies. April 5, 2019. Available at: www.iaea.org/newscenter/statements/challenges-in-nuclear-verification.

¹¹ 2010 NPT Review Conference Conclusions, Action 30. 2010 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons. Final Document. Volume I. NPT/CONF.2010/50 (Vol. I).

¹² Under TPNW Article 3.1, a non-nuclear-weapon state that does not have an additional protocol when the treaty enters into force is not required to conclude one. States such as Iran, Brazil, Egypt, Syria and Saudi Arabia could assert this absolves them from concluding an additional protocol. See Carlson J. Nuclear Weapon Prohibition Treaty: A Safeguards Debacle. VERTIC Trust and Verify. Autumn 2018. No. 158. Available at: <http://www.vertic.org/media/assets/TV/TV158.pdf>.

It is unrealistic to expect that nuclear-armed states will eliminate nuclear weapons by a date set by others, and that umbrella states will immediately renounce extended nuclear deterrence regardless of their national security concerns. These concerns cannot be brushed aside. The 2010 NPT Review Conference Action Plan called for progress on disarmament to be accelerated *in a way that promotes international stability, peace and undiminished and increased security*.¹³ It is essential to find ways of advancing disarmament that are consistent with these objectives.

Ensuring complementarity

As the NPT and the TPNW have the same overall objective, the elimination of nuclear weapons, it is essential to ensure the two treaties are operated so as to optimise the likelihood of achieving this objective. The TPNW is predicated on the nuclear-armed states making the decision to eliminate their nuclear weapons. The NPT is predicated on the need for a step-wise process to reach the point where such a decision can be made. It follows that the most effective implementation of the NPT is essential to the success of the TPNW.

While a step-wise approach to disarmament is implicit in Article VI of the NPT, the definition of the steps is left for further negotiations. Frustration at the current absence of negotiations, let alone specific steps, does not mean this approach is wrong. However, it is imperative for the NWS to recognise the level of concern in the wider international community, and to demonstrate their commitment to progressing the NPT disarmament obligation without further delay. The obvious way of doing this is to commence the negotiations called for in Article VI. Further steps are outlined below.

For their part, TPNW parties need to ensure they support implementation of the NPT, and avoid acting inconsistently with decisions

¹³ NPT 2010 Review Conference. Action Plan, Action 5. 2010 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons. Final Document. Volume I. NPT/CONF.2010/50 (Vol. I).

they have supported in the NPT context. The TPNW provisions on safeguards are an unfortunate example of a disconnect between what states have supported in NPT review conferences and what they have been prepared to accept in the TPNW. It is to be hoped there are no further examples of this kind. While it is not realistic to think of amending the TPNW at this stage, it would be reassuring if TPNW parties without an Additional Protocol demonstrate, by concluding an Additional Protocol, that they do not intend to exploit the weakness in the TPNW text. Other TPNW parties should be encouraging them to do this.

Progressing the disarmament agenda

Progressing the arms control and disarmament agenda is essential not only to meeting the obligations under both the NPT and the TPNW (when it enters into force), this is also essential to reducing the risk of nuclear war.

A step-by-step approach has been elaborated in successive NPT review conferences, notably in the “13 Steps” set out in the Final Document of the 2000 Review Conference. However, as yet there is no agreement to proceed with these or other steps. In broad terms, something along the following lines would provide an effective program of action. This list is not the same as the 13 Steps but has many elements in common. The exact sequence is not critical – what is important is to start the process and demonstrate the resolve to follow through.

Major political declarations and commitments

Above all it is essential to have a strong expression of political commitment and leadership from Russia and the United States, which hold over 90% of the world’s nuclear weapons. Without such commitment and leadership real progress in disarmament will not be possible. Hence a major step in a meaningful step-by-step process would be:

(1) A joint declaration by the Presidents of Russia and the United States that a nuclear war cannot be won and must never be fought.

This would reaffirm the 1985 Gorbachev-Reagan joint statement, sending a positive signal to the international community that the

two major nuclear powers will work together to make the NPT objectives a reality. US elder statesmen Shultz, Perry and Nunn urged such a joint declaration in their Wall Street Journal op-ed in April 2019.¹⁴ Subsequently it has emerged that Russian Foreign Minister Lavrov made a similar proposal to the United States in October 2018.¹⁵ Russia reiterated its proposal on April 26, 2019.¹⁶ At the time of writing the United States had still not responded. It is imperative for this proposal to be acted upon.

If a US-Russia statement can be achieved, this should be extended to a joint statement by all the P5. Indeed, it is reported that China has suggested a P5 statement. The impact of a joint P5 statement cannot be overstated. Further, the P5 acting together would be in a strong position to persuade the non-NPT nuclear states to join in or make similar statements.

(2) Declarations on *no first use* (NFU). Nuclear-armed states would affirm that the sole purpose of nuclear weapons is to deter the use of nuclear weapons by others.

A declaration of NFU is the logical next step after a commitment against nuclear war. NFU is already the stated policy of China and India. NFU would obviate a *launch-on-warning* posture, enabling de-alerting and also addressing concerns about launch authority, discussed below. NFU declarations could be followed by negotiation of a NFU treaty.

Adoption of NFU would be a major step in changing mindsets about nuclear weapons. NFU would help reduce international tensions and contribute to building the trust needed for taking further major steps, such as ending the development of new nuclear weapon types

14 Shultz G., Perry W., Nunn S. The Treat of Nuclear War Is Still With Us // Wall Street Journal. April 10, 2019. Available at: www.wsj.com/articles/the-threat-of-nuclear-war-is-still-with-us-11554936842?mod=hp_opin_pos3&utm.

15 ‘Yes, Yes, Yes’ To Nuclear Peace // Kommersant. April 19, 2019. Available at: <https://www.kommersant.ru/doc/3947593>; US Ignored Russia’s Nuclear War Prevention Pact – Reports // Moscow Times. April 19, 2019. Available at: <https://www.themoscowtimes.com/2019/04/19/us-ignored-russias-nuclear-war-prevention-pact-reports-a65313>.

16 Russia ready to discuss nuclear treaty with China, US // Associated Press. April 26, 2019. Available at: <https://www.apnews.com/3a86a5afa5424a149b72adf01987c034>.

and missions, elimination of tactical nuclear weapons, and elimination of silo-based weapons.

(3) Establishing a multilateral negotiating process on nuclear arms control and disarmament including all the NPT and non-NPT nuclear-armed states.

While the Conference on Disarmament (CD) could provide a negotiating forum for both NPT parties and non-parties, the CD's usefulness is undermined by its consensus rule. Unless this rule is changed a more effective negotiating forum will be required.

To date arms reductions negotiations have been bilateral, between the United States and Russia. In the context of New START (see (6) below) the United States has suggested that China should be brought into further negotiations. China has dismissed the idea of trilateral negotiations, maintaining that the United States and Russia should make greater progress with arms reductions before states with much smaller arsenals need to participate.¹⁷ While China's position is understandable, it overlooks a number of important considerations: the NPT obligation to negotiate applies equally to all NPT parties; the United States and Russia require assurance that as they reduce their nuclear arsenals other nuclear-armed states do not significantly increase theirs; China should consider its responsibilities as one of the P5; and it should think in terms of the positive influence it can have in future negotiations.

Risk reduction steps

(4) De-alerting – removing nuclear weapons from immediate readiness/launch-on-warning status.

Currently the United States and Russia maintain substantial numbers of nuclear weapons on high alert for immediate launching if it appears a nuclear attack is underway. This *use it or lose it* approach is inherently high risk. Historically there have been several false alarms

¹⁷ China Says It Won't Take Part in Trilateral Nuclear Arms Talks // Reuters. May 6, 2019. Available at: <https://www.reuters.com/article/us-usa-trump-putin-china/china-says-it-wont-take-part-in-trilateral-nuclear-arms-talks-idUSKCN1SCOMJ?il=0,%20www.foxnews.com/world/china-has-no-interest-in-joining-us-russia-nuclear-deal>.

which could well have resulted in nuclear war. Even without this danger, maintaining nuclear forces on high alert is an obvious source of international tension. There is no need for a state that has a secure second strike capability to maintain nuclear forces on high alert.

(5) Strengthening checks on launch authority.

It is a terrifying thought that some political leaders have almost unchecked authority to initiate nuclear war. A consequence of maintaining a launch-on-warning posture, for instance, is that checks on launch authority are minimised to enable rapid response in the event of surprise attack. This situation presents serious risks. The issue of checks on presidential launch authority is now being addressed in the United States; it is imperative for all nuclear-armed states to review their launch authorisation procedures and ensure appropriate checks and confidence-building measures.

Progressive reductions in weapon numbers

(6) Agreement by the United States and Russia to extend New START and to initiate negotiations on a successor (START IV?).

New START is due to expire in February 2021 unless extended. Russia sees extension as a priority¹⁸ but the United States has yet to agree. In what some fear is a pretext for inaction the United States has suggested moving straight to negotiating a replacement treaty on a trilateral basis including China.¹⁹ However, even if China is prepared to participate it is clear that such negotiations could not be concluded before New START expires, so at this stage extension of New START must be the priority.

(7) Reduction of deployed nuclear weapons, and progressive dismantlement of excess nuclear weapons.

Considering that current nuclear arsenals are well in excess of the numbers required for credible deterrence, it *should* be relatively easy to agree on major reductions if the parties can approach the

¹⁸ Russia Sees Extension of New START as 'Priority' // Xinhua. May 6, 2019. Available at: http://www.china.org.cn/world/2019-05/06/content_74754398.htm.

¹⁹ Mike Pompeo Wants China to Join Russia in START Nuclear Treaty // Japan Times. April 11, 2019. Available at: www.japantimes.co.jp/news/2019/04/11/asia-pacific/politics-diplomacy-asia-pacific/mike-pompeo-wants-china-join-russia-start-nuclear-treaty/?mkt_tok.

negotiations reasonably. As noted above, if NFU is adopted it should also be possible to agree to elimination of all tactical weapons and silo-based weapons.

There would be a series of agreements on numbers and types of nuclear weapons in deployment, with excess weapons being progressively declared and dismantled. Recovered fissile materials would be declared as excess materials in accordance with (8).

(8) Transfers of excess military fissile material to civilian use, or disposal, under arrangements to ensure *irreversibility*.

Other steps

(9) Bringing the Comprehensive Nuclear Test-Ban Treaty (CTBT) into force without further delay.

The CTBT was concluded in 1996 but is still not in force, due to an excessively difficult entry-into-force formula. The CTBT is important both to strengthen disarmament and non-proliferation efforts and because the delay in bringing it into force is cited by critics as demonstrating the lack of commitment to disarmament.

(10) Negotiating a fissile material cut-off treaty (FMCT).

This treaty would not only cap the material available for nuclear weapons, most importantly it would extend safeguards to all fissile material production facilities (enrichment and reprocessing) to ensure future production is not diverted to nuclear weapons. It is essential to find a way to progress the FMCT negotiations.

(11) Ongoing development of verification, transparency and confidence-building measures in support of nuclear reductions and elimination.

States must not be able to claim lack of effective verification as an excuse for not proceeding with disarmament.²⁰ Another important area is to ensure transparency on nuclear doctrine and nuclear stocks. In

this regard it is regrettable that the Trump administration has reversed the US practice of transparency on nuclear stocks.²¹

Overall framework

As a way of drawing all this together, the International Commission on Nuclear Non-Proliferation and Disarmament (ICNND), in its 2009 report²², recommended a two-phase approach, with *minimisation* as the immediate goal and *elimination* as the ultimate goal. A series of specific steps would be required within each phase. The *minimisation point*, considered to be achievable within 15 years, would be characterised by low numbers of nuclear weapons – a global maximum of 2,000, with 500 each held by the United States and Russia, and no more than 1,000 in total held by the other nuclear-armed states – as well as agreement on no first use, and force deployments and alert status reflecting a NFU posture.

ICNND considered that a target date for getting to zero could not be credibly specified at the outset, but analysis and dialogue could commence immediately on the conditions necessary to move from the minimisation point to elimination. A better idea of a pathway and milestones to elimination should be possible by the time the minimisation point is reached.

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The NWS must not continue to ignore their NPT obligation to pursue disarmament in good faith. Demonstrating that they take this obligation seriously will make a positive contribution to the 2020 NPT Review Conference as well as starting to address the concerns of the international community as expressed through the TPNW. Taking constructive steps to reduce the risk of nuclear war is in the interest of the

²⁰ See for example International Partnership for Nuclear Disarmament Verification, website www.ipndv.org; Carlson J. Verifying the Elimination of Nuclear Weapons and Providing Assurance against Breakout. Asia Pacific Leadership Network. February 2018. Available at: http://a-pln.org/briefings/briefings_view/Policy_Brief_No_57_-_Verifying_the_Elimination_of_Nuclear_Weapons_and_Providing_Assurance_against_Breakout.

²¹ US Reversal of Nuclear Transparency Policy Puts UK in 'Awkward Position' Say Experts // Telegraph. May 4, 2019. Available at: www.telegraph.co.uk/news/2019/05/04/us-reversal-nuclear-transparency-policy-puts-uk-awkward-position/.

²² ICNND was led by Australia and Japan. Eliminating Nuclear Threats: A Practical Agenda for Global Policymakers. International Commission on Nuclear Non-Proliferation and Disarmament Report. 2009. Available at: www.icnnd.org/.

NWS themselves as well as the entire international community.

Time is short. While some of the steps discussed here will take many years to conclude, some important actions can be taken in time for the 2020 Review Conference. A joint declaration against nuclear war is certainly possible, as is action to extend New START. Steps can be commenced to establish a multilateral negotiating process. National actions can be taken, and international consultations initiated where necessary, on NFU declarations, de-alerting, and checks on launch authority. The recommendations of ICNND and other international commissions can be revisited. An initiative could be launched for bringing the CTBT into force.²³

The world cannot afford continuing inactivity on arms control and disarmament. If US antipathy towards these issues continues, Russia and China, with the United Kingdom and France, as well as key NNWS, should work together to prepare the ground for when circumstances are more favourable.

²³ See Carlson J. Comprehensive Nuclear-Test-Ban Treaty: Possible Measures to Bring the Provisions of the Treaty Into Force and Strengthen the Norm Against Nuclear Testing. March 2019. Available at: <https://vcdnp.org/ctbt-possible-measures-to-bring-the-provisions-of-the-treaty-into-force-strengthen-the-norm-against-nuclear-testing/>.

2.3. NON-PROLIFERATION EDUCATION AND THE DANGERS OF NUCLEAR TERRORISM

*William Potter*¹

In 2010 I published a book chapter that featured a fictional dialogue involving a group of would-be nuclear terrorists.² The exercise was designed to illustrate the disconnect between how terrorists and government officials likely view the state of global nuclear security. In the text below, I have sought to update the earlier dialogue. Then, as now, I thought it might be interesting to probe how a group of interested parties not typically engaged by non-proliferation specialists might look at the subject of non-state actors and nuclear violence.³ The dialogue might go something like this:

Terrorist No. 1. What are we doing wrong? This Harvard professor (Graham Allison) has been predicting for the past 15 years that the probability of a nuclear detonation within in ten years is more than 50-50, and yet we haven't done piddly. Are we simply stupid, or unlucky, or have we been going about things in the wrong way?

Terrorist No. 2. We certainly missed a golden opportunity in the 1990s when the Russian nuclear complex was in shambles. As one

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² Nuclear Terrorism and the Global Politics of Civilian HEU Elimination. In *The Global Politics of Combatting Nuclear Terrorism*, ed. by W. Potter, C. Hansell. London: Routledge, 2010. Pp. 7-30.

³ Ibid.

headline read at the time, “**even potatoes were guarded better!**” Now economic conditions have improved and far more facilities have at least basic physical protection measures in place. Today, if we are going to go after the good stuff we will either have to overwhelm their sites with superior force or rely on local criminal organizations to identify the right insiders to obtain the goods for us.

Terrorist No. 3. I don’t think it’s too late – in Russia or in the West. We simply need to adapt to new circumstances. In the case of Russia, the guards at nuclear sites may have winter clothes and may respond to intruder alarms when it’s freezing outside, but their bosses still are dismissive of the insider threat, and they have no idea about how much fissile material they actually have. When was the last time they undertook a comprehensive physical inventory at one of their larger facilities? Besides, why worry about the hundreds of tons of high-end material. All we really need is 50 kilos of highly enriched uranium. We can buy the rest of the items we need for a primitive nuclear device on line on eBay. In fact, why bother with Russia at all when we have a better shot of getting our hands on the good stuff in Belarus, Pakistan, or even in Canada or South Africa.

Terrorist No. 1. You’ve got a point. What I wouldn’t give for some Canadian HEU in liquid waste. I hear it’s particularly easy to mold into a weapon.

Terrorist No. 2. Personally, I would take a totally different tack. We all know about the four faces of nuclear terrorism featured in that old book by Professor Potter:

- the dispersal of radioactive material by conventional explosives or other means;
- attacks against or sabotage of nuclear facilities;
- the theft or purchase of fissile material leading to the fabrication and detonation of a nuclear explosive; and
- the theft or purchase and detonation of an intact nuclear weapon.

But why bother with these forms of nuclear terrorism that either are almost impossible to achieve or are apt to be more disruptive than

destructive. Indeed, except for a number of largely ineffective acts of sabotage of nuclear facilities, we have accomplished next to nothing in the past two decades. I believe we are thinking small and are focused on the wrong approach. If I were to write a book on the subject, I would call it *Six Faces of Nuclear Terrorism*, and I would forget all about trying to obtain fissile material or nuclear weapons. There is no need for them if you really want to engage in existential terrorism.

Terrorist No. 3. What do you have in mind? I understand that a non-state actor would be hard pressed to make or steal more than one or two nuclear weapons, but what are the alternatives?

Terrorist No. 1. I think I know what she is contemplating – we could try to deceive a nuclear weapons possessor into believing it was under attack without ever getting our hands on any nuclear material. I think they call it “spoofing.”

Terrorist No. 2. Exactly. Do you remember the episode in 1995 involving a multi-stage sounding rocket fired off the coast of Norway as part of a scientific experiment? Initially, it was perceived by the Russians as a US submarine-launched ballistic missile. According to one account I read, President Yeltsin held his fire mainly because he couldn’t believe his good friend Bill would do anything so devious. But what would happen today if a similar incident were to take place? I bet you the Russians would assume the worst and retaliate with nuclear force.

Terrorist No. 3. I get it. Great idea and cheap too. I bet one could also employ spoofing to precipitate a nuclear exchange between India and Pakistan. Can you imagine what would happen today if there were a major terrorist incident in Mumbai that was attributed to Pakistan? It might well set off a major nuclear war. But what do you have in mind for the Sixth Face or kind of nuclear terrorism?

Terrorist No. 2. I’m thinking about using cyber measures either to circumvent national command and control procedures in order to launch a nuclear weapon or, alternatively to spoof early warning systems into believing that the other side has launched a first strike. It’s amazing how much you can find on the topic if you go to the NTI

website. As NTI studies and others point out, our ability to employ cyber means to provide false indications of a nuclear attack is greatly enhanced during periods of crisis when tensions are high and trust is low, such as the current situation between the United States and Russia and India and Pakistan.

Terrorist No. 3. Very interesting indeed. However, maybe we also should start thinking about our own command and control procedures in case we succeed in getting on hands on a nuclear weapon or two. Who knows how much control we could exercise over some of our more headstrong colleagues? You should take a look at what I believe is the only study on the subject – a recent paper by Gary Ackerman on “The Non-State Dimension of Nuclear Command, Control, and Communications.”

Terrorist No. 1. Ok, it looks like we’ve got lots of options as long as the international community keeps creating more organizations to fight nuclear terrorism but spends little time on the ground actually doing it. I was getting a little nervous when the Nuclear Security Summit was at its peak and it looked as though some states actually were serious about the matter. Believe it or not, they actually managed to clear out weapons usable material from almost three dozen countries, including all of Latin America! However, that still leaves 9 countries with over two tons of highly enriched uranium or plutonium on their territory and 10 more countries each with between 10 kilograms and two tons of the good stuff. Thank goodness Laura Holgate is no longer in the government! She was making life tough for us. Now, fortunately, the pace of elimination and consolidation has slowed, as has the appetite of the international community for action. US-Russian nuclear security cooperation is now largely a thing of the past and nothing really has taken the place of the high-level Security Summits, notwithstanding the efforts undertaken by the IAEA, the Global Initiative to Combat Nuclear Terrorism, and the Nuclear Security Contact Group. Indeed, even the United States seems to have lost interest in the issue and funding for nuclear security programs has dropped to the lowest levels since the early 1990s.

Terrorist No. 2. I think what you are saying is that our best ally is complacency. It continues to amaze me how few prosecutions there have been anywhere for lax nuclear security, nuclear export control violations, or loss of sensitive nuclear material and technology. Even in those rare cases when someone is prosecuted and convicted, the sentence is apt to be less than that for a common thief. As Professor Potter is fond of saying, “in most countries – developed or undeveloped, there are stiffer penalties for drunk driving than for driving with illicit nuclear material.”

Recommendations

So much for our fictional dialogue. While it is hard to know if actual terrorists would be as well read as those in our fictitious account, there is little doubt that learning has taken place among terrorists, and it would be irresponsible for the international community to assume that terrorists have not made headway in their pursuit of means to inflict nuclear violence. Indeed, one can legitimately question if comparable learning has taken place among most national governments and international organizations about the evolving nature of the nuclear threat and the urgency with which it must be addressed.

What then is to be done? I will not try to respond many of the legitimate points made by our fictional terrorists or to suggest what we must do to reduce the likelihood that fact will imitate fiction as far as nuclear terrorism is concerned. I will only make four brief suggestions.

1. An overarching principle to counter nuclear terrorism should be to secure, consolidate, and eliminate fissile material (and especially HEU) globally. In other words, we should move toward a world in which fewer countries retain fissile material, fewer facilities within countries possess fissile material, and fewer locations within those facilities have fissile material present. As part of this policy, we should promote an initiative to create HEU (and also ideally, Fissile Material) Free Zones, perhaps beginning in Latin America and Eastern Europe.

2. We also must take more seriously the insider threat and learn from the experiences in other industries such as banking, casinos, the

diamond market, and pharmacies that have developed systems to secure their assets from insiders.

3. In addition, we must adapt our nuclear security policies to cope with emerging technologies, and especially cyber, at the same time that we are more attentive to the possibility that non-state actors may resort to novel forms of deception and spoofing for the purpose of precipitating massive violence without ever acquiring nuclear material or weapons themselves; and

4. Finally, we cannot hope to make major headway in countering the threat of nuclear terrorism without reviving US-Russian cooperation in this sphere, including with respect to the sharing of vital intelligence information.

A number of years ago, Michael Levi sought to counter the prevailing pessimism about catastrophic nuclear terrorism by articulating what he called “Murphy’s Law of Nuclear Terrorism” – what can go wrong from a terrorist perspective might well go wrong. I would argue that while Levi was correct about highlighting the danger of assuming that terrorists are as sophisticated as the three fictional ones I introduced in my presentation, we also should not discount the possibility that poorly conceived and implemented US and Russian non-proliferation policies, complacency on the part of other countries, growing stocks of fissile material, and failure to adopt and enforce more stringent export control laws and safeguards regulations can serve as a potent terrorist growth hormone. This is not an argument for focusing most of our resources on the worst case nuclear terror scenario, but it cautions against the assumption that our luck will hold indefinitely. The risk of high consequence nuclear terrorism remains a real peril, but one that is preventable.

2.4. NUCLEAR TERRORISM IN THE CONTEXT OF NUCLEAR THREATS

*Mark Fitzpatrick*¹

Positive developments

In Prague ten years ago, Barack Obama drew global attention to the need for stronger nuclear security.² While the speech drew most acclaim for his recommitment to a nuclear weapons-free world, the US president also committed to actions to enhance nuclear non-proliferation and a new framework for civilian nuclear cooperation. This sparked the creation of a nuclear fuel bank and stronger norms against the spread of enrichment and reprocessing. To combat nuclear terrorism, Obama announced the convening of a summit to focus the highest-level attention to the topic. Four nuclear security summits were held in the succeeding eight years, during which participating countries made nuclear security a head-of-state issue.

While Obama’s initial goal of securing all vulnerable nuclear material around the world within four years proved to be a stretch, the summits stimulated the recovery or elimination of more than 1,500 kilograms of highly enriched uranium (HEU) and separated plutonium, the establishment of dozens of new training and support centers around

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² Remarks By President Barack Obama In Prague As Delivered. The White House. Office of the Press Secretary. April 5, 2009. Available at: <https://obamawhitehouse.archives.gov/the-press-office/remarks-president-barack-obama-prague-delivered>.

the world, and many improvements to national laws on nuclear safety and security.³ The number of states that possess nuclear-weapons material that could fuel terrorist bombs has been reduced to 24. More than 50 civilian research reactors have shut down or converted from HEU to low enriched uranium. The 2018 annual assessment undertaken by the Nuclear Threat Initiative (NTI) found that among the 45 countries surveyed, 78% have improved their “sabotage ranking scores” in the previous six years.⁴ Spurred by the action-forcing deadlines set by the Nuclear Security Summit process, more than 100 nations have ratified the Amendment to the Convention on the Physical Protection of Nuclear Material (CPPNM), committing themselves to provide additional layers of protection for all nuclear material in their possession, including during storage, transport, and use.⁵ With the 2016 Nuclear Security Summit serving as an action-forcing event to spur ratifications, the amendment became legally binding that year.

Nuclear security has also been enhanced by developments in other spheres. Chief among these, the 2015 Joint Comprehensive Plan of Action, blocked Iran’s potential pathways to a nuclear weapon and imposed the most intrusive inspection regime ever negotiated, thereby reducing prospects for clandestine nuclear production. In addition to the non-proliferation benefits, preventing nuclear weapons development in Iran has the benefit of foreclosing any possibility of Iranian nuclear material being transferred, even inadvertently, to terrorist groups. It is highly regrettable that President Donald Trump’s decision in May 2018 to withdraw from the deal and the additional sanctions he has imposed has now forced Iran to reconsider its commitments in ways that may soon end the deal.

3 Cann M., Davenport K., Parker J. The Nuclear Security Summit: Accomplishments of the Process. Arms Control Association and Partnership for Global Security. March 2016. P. 1, Available at: <https://www.armscontrol.org/files/The-Nuclear-Security-Summits-Accomplishments-of-the-Process.pdf>.

4 NTI Nuclear Security Index Theft, Sabotage: Building a Framework for Assurance, Accountability, and Action (Fourth Edition). Nuclear Threat Initiative. September 2018. Available at: https://ntiindex.org/wp-content/uploads/2018/08/NTI_2018-Index_FINAL.pdf.

5 As of July 25, 2018, 118 states had ratified the amendment. The IAEA list of ratifying states has not been updated since then. Amendment to the Convention on the Physical Protection of Nuclear Material. July 25, 2018. Available at: https://www-legacy.iaea.org/Publications/Documents/Conventions/cppnm_amend_status.pdf.

Of more direct relationship to quelling nuclear terrorism are the successful battles that have been waged against the leading terrorist groups: Al-Qaeda and the Islamic State of Iraq and the Levant (ISIL, also known as ISIS and the Islamic State). Their leadership ranks have been shattered and their safe havens eliminated, thereby greatly diminishing their ability to mount terrorist attacks employing nuclear material or directed against nuclear facilities. Unfortunately, decapitating these groups has not killed them. Like the Hydra of Greek mythology, terrorist groups have instead metastasized, with Al-Qaeda, for example, having spawned affiliates including Al-Qaeda in the Arabian Peninsula, al-Shabaab in Somalia, the al Nusra Front and several others. Some of these affiliates are deemed more dangerous than Al-Qaeda itself. Counter-terrorist operations and the collateral damage they cause among civilian populations have also exacerbated a sense of grievance in the Islamic world that is a potent recruitment tool for terrorists.⁶

So how serious is the danger of nuclear terrorism today? In the 15 years since Harvard Professor Graham Allison called nuclear terrorism “inevitable,”⁷ the world has yet to see any such horrendous acts. The most alarming near-incident to date was the case of attempted nuclear terrorism in Belgium in 2016, when men affiliated with ISIS appeared to be looking for ways to acquire material for dirty-bombs from a nuclear center that produces radioisotopes for medical and industrial purposes.⁸ Most recently, Greenpeace crashed a drone into a nuclear facility in France in July 2018 to demonstrate its vulnerability.⁹

6 Allison G. Nuclear Terrorism: Did We Beat the Odds or Change Them? // PRISM. 2018. Vol. 7, No. 3. P. 13. Available at: <https://cco.ndu.edu/News/Article/1507316/nuclear-terrorism-did-we-beat-the-odds-or-change-them/>.

7 Allison G. Nuclear Terrorism: The Ultimate Preventable Catastrophe. 2004. New York, NY: Henry Holt & Company.

8 Malone P., Smith J. A Terrorist Group’s Plot to Create a Radioactive “Dirty Bomb”: ISIS Was Looking for Nuclear Materials, and Belgium Was a Smart Place to Hunt. The Center of Public Integrity. February 2016. Available at: <https://publicintegrity.org/national-security/a-terrorist-groups-plot-to-create-a-radioactive-dirty-bomb/>.

9 Greenpeace Activists ‘Crash’ Drone into French Nuclear Plant // Agence France-Presse. July 3, 2018. Available at: <https://www.yahoo.com/news/greenpeace-activists-crash-drone-french-nuclear-plant-134507827.html>.

That we can point only to near-incidents and demonstrations rather than nuclear terrorist attacks is thanks partly to luck but also to the steps taken by concerned states to fortify defenses, enhance intelligence and interception capabilities and close vulnerabilities. Yet based on a review of the actions taken in the past decade that have reduced the risk of nuclear terrorism and the factors that have increased these risks, Allison assesses that the chance of a successful nuclear terrorist attack somewhere in the world before the end of 2024 are greater than 50%. As he writes, the absence of such an attack to date is “not grounds for complacency, but rather a reason for redoubling our efforts.”¹⁰

Unfortunately, nuclear security efforts are not being redoubled. Rather, top-level attention to the issue has become diffused. While Obama’s successor has not treated nuclear security with anything near the antipathy that he has displayed toward other Obama initiatives, neither has Trump shown any interest in the topic. Leadership has largely devolved to the International Atomic Energy Agency (IAEA), which carries out a myriad of activities aimed at improving nuclear security through educational, training and collaborative networks, as well as information sharing and other activities.¹¹ Such work-a-day efforts, no matter how useful, do not inspire top-level attention or creative solutions to address key vulnerabilities.

Vulnerabilities

North Korea

Given North Korea’s assistance to Syria in constructing a plutonium-production reactor at al-Kibar (before Israeli jets destroyed it in 2007) and its record of selling missiles and other military hardware to states in the Middle East, Africa and elsewhere,

¹⁰ Allison G. Nuclear Terrorism: Did We Beat the Odds or Change Them?...

¹¹ IAEA, Nuclear Security Report 2018, GOV/2018/36-GC(62)/10. August 6, 2018. Available at: https://www-legacy.iaea.org/About/Policy/GC/GC62/GC62Documents/English/gc62-10_en.pdf.

there has long been concern that Pyongyang might also be willing to sell nuclear wares to terrorist groups. In fact, North Korean officials have threatened to do just that. In 2005, Vice Minister Kim Kye-gwan told an American reporter that the United States “should consider the danger that we could transfer nuclear weapons to terrorists.”¹²

The United States has indeed considered this danger and continues to do so. In an interview in March 2018 before taking up his post as US National Security Advisor, John Bolton said: “It’s not simply the threat of what North Korea would do with its own nuclear weapons. It’s the threat they would sell those weapons to others, to Iran, to Al-Qaeda, to other would be nuclear powers. That is a real danger...”¹³ Allison, who calls North Korea “the world’s leading candidate to become ‘Nukes ‘R’ Us’,” cautions that the tightened sanctions imposed on North Korea give it a greater incentive to earn income on the nuclear black market.¹⁴ Meanwhile, Pyongyang continues to increase its holdings of nuclear material. Based on the operating periods of the 5MWe Magnox reactor as observed by satellites, the known reprocessing campaigns, and assumptions about how much was used in North Korea’s six nuclear tests to date, the stockpile of weapons-grade plutonium is probably between 18 and 30 kilograms. This is enough for at least 3-6 bombs.¹⁵

North Korea’s production of HEU is much harder to estimate, because the size, number, efficiency and operational history of the state’s enrichment facilities is unknown. Many US experts believe that in addition to the announced facility at Yongbyon, two other enrichment facilities have been in operation for several years. The combined enrichment capacity might be as high as 120 kilograms/year, although it is

¹² Harrison S. N. Korea Warns of Nuclear Proliferation Possibility: US Scholar // Kyodo News Service. April 9, 2005.

¹³ John Bolton Interview with Jon Scott // Fox News. March 21, 2018. Available at: https://video.foxnews.com/v/5755642461001/?playlist_id=2781265786001#sp=show-clips.

¹⁴ Allison G. Nuclear Terrorism: Did We Beat the Odds or Change Them? P. 13.

¹⁵ Fitzpatrick M. Khlokov A. DPRK Strategic Capabilities and Security on the Korean Peninsula: Potential Steps for Tension Reduction, Confidence-Building, and Denuclearization.” A Joint Study by the International Institute for Strategic Studies (IISS) and the Center for Energy and Security Studies (CENESS), forthcoming.

likely to be less. Taking into account production losses and the amount used in tests to date, a team of Russian and US experts estimates that the HEU stockpile could range from 150 to 650 kilograms.¹⁶ Assuming 20 kilograms is needed for one bomb, this is enough for seven to thirty warheads. At the higher end of such estimates, North Korean officials conceivably could conclude that they have more than enough for their own purposes, and thus some could be sold for profit. Given the relative simplicity of making HEU gun-type bombs (in contrast to the implosion method that is required for plutonium), this material is generally considered potentially attractive to non-state actors. It is thus all the more important that the engagement underway since early 2018 with North Korea succeeds in stopping its continued production of nuclear material and agreeing on steps to the elimination of existing stocks.

South Asia

While the gravest nuclear danger in South Asia is the potential for a nuclear exchange between India and Pakistan, the prospect for nuclear terrorism garners the most attention. The arrest this March of Wikileaks founder Julian Assange reminded observers of the release of US diplomatic cables that expressed concern that fissile material in Pakistan could fall into the hands of terrorists. A February 2009 cable from the US Embassy in Islamabad said: “our major concern is not having an Islamic militant steal an entire weapon but rather the chance someone working in government of Pakistan facilities could gradually smuggle enough material out to eventually make a weapon.”¹⁷

The concern is based on Pakistan’s growing stockpiles of fissile material, the number and brazenness of extremists in the country and the creeping fundamentalism of the society. The more weapons and fissile material that is produced, the more potential there is for

theft, seizure or sabotage, especially when materials are in transit. The threat is often exaggerated, however. While four terrorist groups in Pakistan have reportedly expressed interest in nuclear weapons, their inclinations are largely opportunistic. At least six terrorist attacks have occurred at military facilities that reportedly house nuclear assets but not necessarily because of those assets, which were never in danger. A fundamentalist takeover of the country is highly unlikely given the cohesion and discipline of the army and the esteem in which it is held. Pakistan has taken significant steps to protect its nuclear program; indeed, it is likely that no nation devotes more attention to the need. Yet the danger of insider collusion cannot be dismissed, because no protective system is failsafe.¹⁸ In the NTI’s Nuclear Security Index of theft risk, India and Pakistan rank 19th and 20th among 22 countries possessing weapons-usable nuclear material, followed only by Iran and North Korea.¹⁹

Cyber security

The NTI Index for 2018 identified cyber security as an area of particular inadequacy. Among the countries surveyed that have weapons-usable nuclear materials or nuclear facilities, only 12 countries and Taiwan were given full credit, confirming the establishment of the basic cybersecurity regulations measured by the NTI Index.

The Index noted three publicly known cases of cyber-attacks or attempts on information systems at nuclear facilities in Japan, Germany and the United States in 2016 and another in the United States in 2017.²⁰ These are only the incidents that have come to public attention. It could be that other cyber-attacks affecting nuclear facilities elsewhere have been kept under wraps in order not to reveal vulnerabilities or to embarrass authorities.²¹

¹⁶ Ibid.

¹⁷ WikiLeaks Cables Expose Pakistan Nuclear Fears // The Guardian. November 30, 2010. Available at: <https://www.theguardian.com/world/2010/nov/30/wikileaks-cables-pakistan-nuclear-fears>.

¹⁸ Fitzpatrick M. Overcoming Pakistan’s Nuclear Dangers. 2014. London: Routledge, for the International Institute for Strategic Studies. P. 157.

¹⁹ NTI, Nuclear Security Index Theft... P. 29.

²⁰ Ibid. P. 16.

²¹ Baylon C., Brunt R. Livingstone D. Chatham House Report Cyber Security at Civil Nuclear

The cyber threat to nuclear security is usually addressed in the civilian sector. A 2016 NTI report, for example, addressed three types of risk potentially posed by non-state actors. The report explored how terrorists or hackers could: 1) sabotage civilian nuclear facilities to cause a release of radiation; 2) hold a nuclear facility hostage to demands; or 3) employ a cyber breach to facilitate the theft of weapons-usable fissile material.²² More recently, the cyber risk to military command and control systems has come under increased scrutiny.

In 2018, NTI released a report developed by a study group that explored the potentially catastrophic consequences of a cyberattack on nuclear weapons systems, including nuclear planning systems, early warning systems, communication systems, and delivery systems. A key finding of the report was that: “cyber threats to nuclear weapons systems increase the risk of use as a result of false warnings or miscalculation, increase the risk of unauthorized use of a nuclear weapon, and could undermine confidence in the nuclear deterrent, affecting strategic stability.”²³

The International Institute for Strategic Studies (IISS) has also researched such vulnerabilities. A table-top exercise conducted by the IISS in London in November 2018 sought to explore several malfeasance pathways in a plausible crisis scenario, to illustrate how malevolent actors can use artificial intelligence (AI) and other new technologies to deceive, disrupt, or impair nuclear command-and-control systems and their human controllers. The exercise demonstrated how an AI arms race may negatively affect strategic stability as the NWS become more reliant on AI for strategic warning in relation to nuclear command and control functions.²⁴

Facilities: Understanding the Risks. Chatham House. September 2015. Available at: https://www.chathamhouse.org/sites/files/chathamhouse/field/field_document/20151005CyberSecurityNuclearBalyonBruntLivingstone.pdf.

22 Van Dine A., Assante M., Stoutland P. Outpacing the Cyber Threat: Priorities for Cybersecurity at Nuclear Facilities. December 7, 2016. Available at: <https://www.nti.org/analysis/reports/outpacing-cyber-threats-priorities-cybersecurity-nuclear-facilities/>.

23 Stoutland P., Pitts-Kiefer S. Nuclear Weapons in the New Cyber Age: Report of the Cyber-Nuclear Weapons Study Group. Nuclear Threat Initiative. September 2018. Available at: https://media.nti.org/documents/Cyber_report_finalsmall.pdf.

24 Fitzpatrick M. Artificial intelligence and Nuclear command and control. The Survival Editors Blog.

As noted in a report of the workshop,²⁵ a key danger played out in the exercise was the potential for third parties to spoof warning systems and create “deep fakes” to fool human operators. In the scenario, a hitherto unknown non-state actor, the “World Peace Guardians,” circulated falsified videos and photographs on social media platforms to create the impression that three US special forces soldiers had been killed in Syria by nerve gas in clashes with Russian military advisers in Syria. Some US pundits argued the legal case for use of tactical nuclear weapons in response. Doctored videos then appeared on media platforms that showed the families of prominent officials hurriedly departing the capital. Further “eyewitness” accounts on social media claimed that missile silos in the western United States had gone to high alert level, and that two had even opened. As a result of these and other secondary indicators used by Russian AI-driven situational awareness algorithms, Moscow’s strategic warning systems began informing the Kremlin leadership that a US missile launch could be imminent.

Some details notwithstanding, the scenario was a plausible example of the vulnerability of “escalation by third parties”: how a non-state actor in this case could create a deep fake so believable that it created a crisis between two nuclear states. A workshop background paper explained how offensive AI capabilities widen the psychological distance between the attacker and its target. The paper forewarned that a third-party actor might attempt to use AI-driven adversarial inputs, data-poisoning attacks, and audio and video manipulation to create escalatory effects between nations. While other early warning systems would discredit the spoof, it could still create high levels of uncertainty and tension in a short amount of time, forcing parties to put their militaries on high alert. It would require overhead imagery, signals intelligence, and/or human reporting to determine the on-the-ground

April 26, 2019. Available at: <https://www.iiss.org/blogs/survival-blog/2019/04/artificial-intelligence-nuclear-strategic-stability>.

25 Ibid. The rest of this subsection is drawn from the report of the exercise.

reality – something that would take precious time during an escalatory crisis with AI algorithms urging immediate response actions.

Third-party-generated deep fakes can be magnified by AI capabilities that fall into the wrong hands and are used to generate false positives. In the workshop scenario, three months before the crisis and start of play, US Cyber Command's platform for managing and coordinating integrated cyber, electronic, and information warfare operations was providing statistically anomalous outputs regarding situational awareness assessments related to early warning of selected Advanced Persistent Threat data sets linked to Russian cyber actors. The questionable reports appeared to be skewed by mathematical coefficients derived from large-scale metadata analysis during the beta-testing training phase of the platform's software. A workshop background paper noted that AI programs are driven by the data that they receive – the digital equivalent of the adage “you are what you eat.”

In the exercise, nuclear command-and-control personnel faced a “black-box problem,” that is, the difficulty in determining how or why a system came to a certain conclusion. While system inputs and outputs can be observed, the speed and scale of system processes make it difficult for personnel to isolate the logic behind any particular prediction. Once put into place, AI systems operate without the ability for real-time human monitoring of their decision calculus.

The workshop background paper explained how “raising the noise floor” – a cyber-attack via noise and extraneous inputs containing minor elements of an actual threat – can cause an AI system to generate a stream of false positives. These false positives can lead operators to reconfigure the AI's machine-learning algorithm to avoid this error in the future. At that point, the adversary can launch an attack through the same method that the system was reconfigured to ignore. It is notable that, unlike other technical operations, this type of attack targets the human operators and induces them to effect a change that favors the offensive adversary. While the AI system faithfully does what it has been re-instructed to do, the parameters no longer successfully serve

the defensive purpose. Accordingly, this approach could be deemed a form of social engineering.

In the exercise, shared concerns about AI-generated disinformation fostered collaboration among states to address the problem. A fictional nuclear power plant in Hubei Province, China, suffered structural damage as a result of operating beyond engineering parameters due to loosening of the security indicators contained in its management software after several other plants appeared to experience false positive safety reports. Although the situation was contained in time, the Hubei plant was said to be ‘minutes away from the next Chernobyl or Fukushima.’

When the operating systems of Chinese nuclear power plants raised the warning noise floor in ways that appeared to seek to weaponize them, the US team shared information it had about similar noise warnings in American plants. The IAEA became the forum for cooperative efforts for a solution. More broadly, the potentially destabilizing risks inherent to emerging technologies, as demonstrated in the Chinese nuclear power example, could push states to proactively seek multilateral arms-control and nuclear security measures.

Looking ahead

CPPNM Review Conference

One opportunity for states to collectively enhance nuclear security arises in connection with the upcoming 2021 Review Conference for the CPPNM Amendment, five years after it came into force. As an organizing principle for the event, the Review Conference should lay the foundation for a strong, effective and sustainable treaty regime. The conference thus should focus on substance rather than merely procedure.

The Review Conference will serve as an important milestone to evaluate the implementation and adequacy of the CPPNM Amendment, which does not include any verification measures. The Review

Conference could usefully address this lacuna by recommending that states employ IAEA International Physical Protection Advisory Service missions to assess their nuclear security and physical protection framework. In making this recommendation, former Netherlands Ambassador for Nuclear Security Kees Nederloff also suggests that the review process take a 360-degree look at physical protection, taking into consideration other instruments and resources.²⁶ Among other themes, the conference should discuss current and possible future threat situations, including computer security and illicit trafficking, as well as current and emerging technologies, including drones.

A working group meeting of legal and technical experts will be held in July 2019 to begin the preparatory process for the Review Conference. From the beginning, states should agree that the conference will tackle substantive issues, so as to set a proper precedent for continued work. Looking to the future, it would make sense to agree on periodic review conferences at five-year intervals. The Review Conference should also address the goal of universalizing the Convention. As of July 2018, about three dozen states that acceded to the original CPPNM had yet to accept the Amendment. Once they do so, the original convention will disappear, according to the IAEA Legal Department.²⁷

Military-use material

Ideally, the Review Conference should also take up the challenge of subjecting military-use nuclear materials to standards of accountability that have become the norm for civilian use material. The four-fifths of nuclear material that is in such military use is neglected in the relevant instruments, despite the goal espoused at IAEA General

²⁶ Nederlof K. The Amended Convention on the Physical Protection of Nuclear Materials (CPPNM): What has been Achieved and What Remains to be Done.” In *An Arms Control Association and Fissile Materials Working Group Report The Nuclear Security Summits: An Overview of State Actions to Curb Nuclear Terrorism 2010-2016*, ed. by S. Kutchesfahani, K. Davenport, E. Connolly. Arms Control Association. July 2018. Pp. 10-14. Available at: https://www.armscontrol.org/sites/default/files/files/Reports/NSS_Report2018_digital.pdf.

²⁷ Ibid. P. 12.

Conferences since 2013 of protecting “all” nuclear material. The states that possess nuclear weapons show little interest in opening a discussion on developing security guidelines or best practices for control, protection, and accounting of military-use nuclear material. Yet there are ways to discuss the matter without jeopardizing security or confidentiality.

A report by three leading think tanks in September 2016 that this author had the honor of co-directing offered several legal, political, and institutional options for advancing international oversight of military-use material.²⁸ The first set of recommendations involved the minimization, elimination, and consolidation of weapons-usable nuclear materials. A second category involved the voluntary application of civilian norms, recommendations, and guidelines to all weapons-usable nuclear materials. Civilian standards applied to date are far from perfect but they represent a minimum level of due diligence that should be applied to nuclear materials in all sectors. A third category focused on exercises, training, and sharing of best practices, such as the US-Russia Nunn-Lugar programs and various bilateral and trilateral exchanges of best practices. A fourth set of recommendations addressed transparency and reporting. Nuclear-armed states should report to the international community to provide greater confidence that they are securing all nuclear materials.

One recent development points to the vulnerability posed by stocks of fissile material. The documents about Iran’s nuclear-weapons development work in the period 1999-2003 that were seized and revealed by Israel in 2018 mentions a budget that Iran had allowed for purchasing HEU abroad. In assessing this point, the Harvard Belfer Center notes: “the fact that Iran’s government was optimistic enough about the prospects to assign a budget for such a purchase highlights

²⁸ Improving the Security of All Nuclear Materials: Legal, Political, and Institutional Options to Advance International Oversight. Report by the International Institute for Strategic Studies (IISS), the James Martin Center for Nonproliferation Studies (CNS) and the Vienna Center for Disarmament and Non- Proliferation (VCDNP). Commissioned by the Government of Switzerland. September 2016. Available at: http://vcdnp.org/wp-content/uploads/2016/09/IISS-CNS-VCDNP-report_Final.pdf.

the potential proliferation dangers posed by either states or non-state actors willing to sell weapons-usable nuclear material.”²⁹ Adding to the danger is the potential willingness of nuclear weapons experts to work outside their home countries. According to Israeli officials, Iran recruited over a dozen such experts from several countries.³⁰ This does not mean that they would also be willing to work for non-state actors, but neither can this risk be overlooked.

Russia-US cooperation

It goes without saying that enhancing nuclear security globally will require cooperation between the nuclear superpowers, who together possess 90% of all nuclear weapons in the world. Past US-Russia partnership through the Nunn-Lugar Cooperative Threat Reduction Program was instrumental in securing “loose” nuclear material in states of the former Soviet Union. The US-Russia nuclear security cooperation that collapsed after Russia’s invasion of Ukraine in 2014 must be restored. Among other specific programs, the Plutonium Management and Disposition Agreement of 2000 should be put back on track, as should the patterns of exchange of practices for protecting nuclear materials via exchanges between the two countries’ nuclear weapons laboratories. The High-Level US-Russia Presidential Commission working group on nuclear energy and security should be restored, and the two parties should resume their collective leadership of the Global Initiative to Combat Nuclear Terrorism. Preventing nuclear terrorism is the most obvious area of common interest between Russia and the United States.

²⁹ Arnold A., Bunn M., et al, *The Iran Nuclear Archive: Impressions and Implications*. Belfer Center for Science and International Affairs. Harvard Kennedy School. April 2019. P. 10.

³⁰ Ibid. P. 9.

2.5. THE SUFFICIENCY OF EXISTING NORMS AND MECHANISMS TO PREVENT THE TOTAL COLLAPSE OF THE JCPOA

Tariq Rauf¹

On May 8, 2018, President Donald J. Trump carried out his previously announced threat on US withdrawal from the EU/E3+3+Iran Joint Comprehensive Plan of Action (JCPOA) signed on July 14, 2015 by the Obama administration, and the re-imposition of economic sanctions on Iran. The leaders of the E3 (France, Germany and the United Kingdom) reiterated their continuing support for the JCPOA as long as Iran abided by its nuclear obligations; while Iran called on the three EU countries to implement the agreement even without the United States.

According to the International Atomic Energy Agency (IAEA), which is charged with the monitoring and verification of limitations on Iran’s nuclear program pursuant to the JCPOA, as well as the implementation of Agency safeguards on the entirety of Iran’s nuclear materials, activities and facilities under the Non-Proliferation Treaty (NPT), Iran remains in compliance with its obligations under the JCPOA and the NPT. According to the IAEA Director General, “the arrangements in place for Iran, comprising a Comprehensive Safeguards

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Agreement, Additional Protocol, and additional transparency measures under the JCPOA, amount to the most robust verification system in existence anywhere in the world.”²

The JCPOA was endorsed unanimously by the UN Security Council (UNSC) through the adoption of resolution 2231 (2015), on July 20, 2015. In this regard, it is useful to recall some of the provisions of UNSCR 2231:

- [the Security Council ... underscored] that **Member States are obligated under Article 25** of the Charter of the United Nations to **accept and carry out the Security Council’s decisions**,
- [the Security Council] **Calls upon all Members States**, regional organizations and international organizations **to take such actions as may be appropriate to support the implementation of the JCPOA**, including by taking actions commensurate with the implementation plan set out in the JCPOA and this resolution and **by refraining from actions that undermine implementation of commitments under the JCPOA** (emphasis added).

The US denunciation of the JCPOA thus clearly runs contrary to UNSC resolution 2231 and to the UN Charter. This action by the United States to unilaterally withdraw from the JCPOA is in violation of the principle of international law of *pacta sunt servanda* – which affirms that States are obligated to honor their international treaties and agreements and to act in good faith. Thus, unfortunately, the United States now finds itself in the unenviable position of an international scofflaw.

In early May 2019, Iran declared that it would no longer abide by the JCPOA limits on production of low enriched uranium (LEU) and heavy water, it could restart construction on the research reactor at Arak, and resume uranium enrichment above 3.67% U-235 in the future if sanctions relief was not forthcoming; and that Iran even could consider withdrawing from the NPT. This threat by Iran to disregard

the limitations of the JCPOA, and even to withdraw from the NPT, also cannot contribute to resolving the current crisis over the JCPOA in a satisfactory and peaceful manner.

The JCPOA was signed in Vienna on July 14, 2015 between Iran and the EU/E3+3 – that includes China and the Russian Federation in addition to the others.³ It is incorrect to refer to the JCPOA as the “P5+1” agreement. Security Council resolution 2231 terminated all provisions of previous UN Security Council sanctions resolutions regarding the Iranian nuclear issue – 1696 (2006), 1737 (2006), 1747 (2007), 1803 (2008), 1835 (2008), 1929 (2010) and 2224 (2015) – simultaneously with IAEA-verified implementation by Iran of agreed JCPOA nuclear-related provisions.⁴

Following the conclusion of the JCPOA in July 2015, during the remainder of the term of the Obama administration ending on January 20, 2017, the IAEA issued 17 reports covering, *inter alia*: (a) Final Assessment on Past and Present Outstanding Issues regarding Iran’s Nuclear Program; (b) Verification and Monitoring in the Islamic Republic of Iran in light of United Nations Security Council Resolution 2231 (2015); (c) Road-map for the Clarification of Past and Present Outstanding Issues regarding Iran’s Nuclear Program; (d) Implementation of the NPT Safeguards Agreement and relevant provisions of Security Council resolutions in the Islamic Republic of Iran; and (e) Status of Iran’s Nuclear Program in relation to the Joint Plan of Action.

³ The full text of the JCPOA is available at: http://eeas.europa.eu/statements-eeas/docs/iran_agreement/iran_joint-comprehensive-plan-of-action_en.pdf; International Atomic Energy Agency, INFCIRC/887 (July 31, 2015); E3/EU+3 stands for France, Germany and the United Kingdom (E3), European Union (EU), and China, Russian Federation and United States (+3).

⁴ United Nations Security Council, Resolution 2231 (2015), July 20, 2015; Resolution 2231 stipulated that within 30 days of receiving a notification by a JCPOA signatory state of an issue that that state believes constitutes significant non-performance of commitments under the JCPOA, the Council shall vote on a draft resolution to continue in effect the terminations of the provisions of previous Security Council resolutions. It further stipulated that if the Security Council does not adopt a resolution to continue in effect the termination of previous resolutions, then effective midnight GMT after the thirtieth day after the notification to the Council, all of the provisions of resolutions 1696 (2006), 1737 (2006), 1747 (2007), 1803 (2008), 1835 (2008), 1929 (2010) and 2224 (2015) shall apply in the same manner as they applied before the adoption of resolution 2231.

² Challenges in Nuclear Verification. Statement by the IAEA Director General. Washington: Centre for Strategic and International Studies. April 5, 2019.

On May 25, 2016, US Ambassador Stephen D. Mull, then-Lead Coordinator for Iran Nuclear Implementation, in his testimony to the Senate Committee on Banking, House, and Urban Affairs, stated: “the JCPOA has been implemented by all participants” and that “Iran had completed dozens of specific actions to limit, freeze, or roll back its nuclear program and subject it to greater transparency by the IAEA.”⁵

During the term of the Trump administration, the IAEA has issued 9 reports on Verification and Monitoring in the Islamic Republic of Iran in light of United Nations Security Council resolution 2231 (2015).

As noted above, the IAEA has confirmed that Iran continues to abide by the limitations on its nuclear program in accordance with the terms of the JCPOA and also is abiding by its NPT comprehensive IAEA Safeguards Agreement and Additional Protocol.

Can the JCPOA be preserved in light of the US’ unilateral withdrawal and pressure on the other signatories to cease all economic and trade cooperation with Iran, is a difficult question to answer given the its overwhelming control and influence over the international financial system. Are existing norms and mechanisms sufficient to prevent the total collapse of the JCPOA? This, too, is a difficult question, the answer to which would likely be “no.” How could the impasse be resolved?

Given the mandate of this paper which is limited to the JCPOA, it will not delve into Iran’s actions in the region of the Gulf and the Middle East, nor into its dismal human rights record but limit itself to matters pertaining to the nuclear dimensions of the JCPOA and will attempt to provide some thinking on these questions, after briefly reviewing the nuclear provisions of the JCPOA, the position and chronology of the Trump administration’s dealings with the JCPOA, the views of the other parties to the JCPOA as expressed at the recent NPT meeting in New York, and the technical conclusions by the IAEA on Iran’s compliance.

⁵ Understanding the Role of Sanctions Under the Iran Deal: Administration Perspectives. US Senate Committee on Banking, House, and Urban Affairs, Hearings. May 25, 2016.

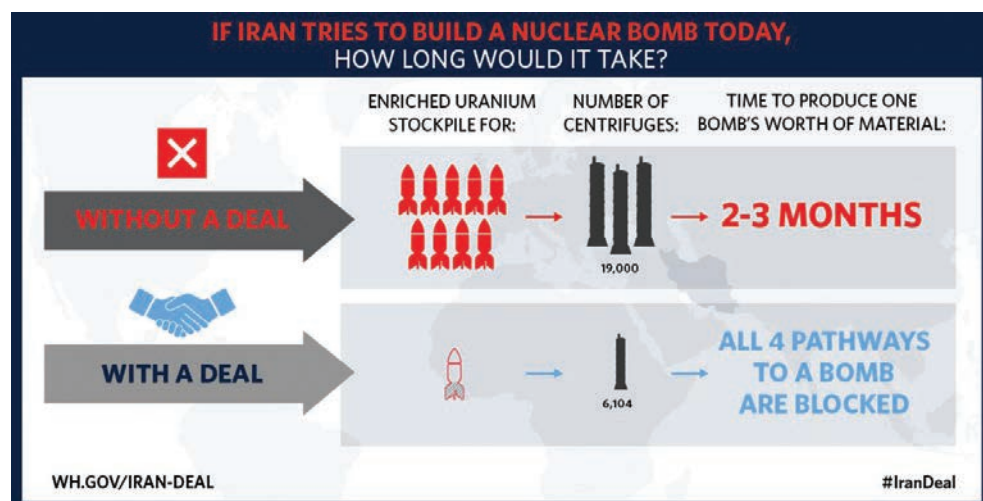
Joint Comprehensive Plan of Action

Under the JCPOA, Iran reaffirmed that under no circumstances would it ever seek, develop or acquire any nuclear weapons, and to implement the Additional Protocol to its NPT Safeguards Agreement with the IAEA. Iran voluntarily undertook to reduce its operating centrifuges from nearly 20,000 machines to 6,100 IR-1 centrifuges, of which 5,060 would remain operational. Excess centrifuges and related infrastructure at Natanz would be stored under continuous IAEA monitoring. Iran agreed to limit enrichment of uranium to 3.67% U-235 and to ship out its inventory of enriched uranium hexafluoride (UF⁶) except for 300 kilograms – a level that would be maintained for 15 years. The Fordow enrichment plant would be converted into a nuclear technology center with 1,044 IR-1 centrifuges that would be transitioned for stable isotope production, for a period of 15 years. Iran agreed to redesign and rebuild a modernized heavy-water reactor at Arak based on an internationally agreed design, use uranium hexafluoride (UF⁶) enriched to 3.67% U-235 for power reactor fuel, and to remove and render dysfunctional the core of the under construction 40 megawatt (MW) Arak reactor. Iran would not reprocess spent nuclear fuel and not build any other heavy-water reactors for 15 years; and would cap at 130 metric tons its stocks of nuclear grade heavy water.

Iran further agreed to implement the Additional Protocol to its NPT safeguards agreement and fully implement modified code 3.1 of the subsidiary arrangements to its safeguards agreement, on the early provision of design information of nuclear facilities. Iran agreed to allow the IAEA to monitor the implementation of the voluntary measures for their respective durations, as well as to implement transparency measures, including: a long-term IAEA inspector presence in Iran; daily and short-/no-notice inspections; monitoring of uranium ore concentrate produced by Iran from all uranium ore concentrate plants for 25 years; containment and surveillance of centrifuge rotors and bellows for 20 years; use of IAEA approved and certified modern technologies including online enrichment measurement and

electronic seals; and a reliable mechanism to ensure speedy resolution of IAEA access concerns for 15 years. Iran also agreed not to engage in activities, including at the R&D level that could contribute to the development of a nuclear explosive device including uranium or plutonium metallurgy activities.

The Obama White House released a JCPOA package for public information that highlighted the principal achievements of the agreement and the limitations agreed by Iran on its nuclear program.



Source: The White House, Washington: July 2015.

UN Security Council resolution 2231 (2015), *inter alia*, requested the Director General of the IAEA to undertake the necessary verification and monitoring of Iran's nuclear-related commitments under the JCPOA, and reaffirmed that Iran shall cooperate fully as the IAEA requested to be able to resolve all outstanding issues, as identified in IAEA reports.⁶ Accordingly, in its meeting on August 25, 2015, the IAEA Board of Governors authorized the Director General to undertake verification and monitoring of Iran's nuclear-related commitments under the JCPOA as requested by the Security Council and to report for the full duration of those commitments in light of Security Council resolution 2231 (2015).⁷

Under the JCPOA, a Joint Commission was established to meet at the level of Political Directors of JCPOA participating States, chaired by the European External Action Service (EEAS) Deputy Secretary General for Political Affairs.⁸ The Commission serves as a dispute resolution

⁶ Verification and Monitoring in the Islamic Republic of Iran in light of United Nations Security Council Resolution 2231 (2015)', GOV/2015/53 (August 14, 2015). International Atomic Energy Agency, Report by the Director General.

⁷ IAEA Board Discusses Safeguards Implementation in Iran. International Atomic Energy Agency. August 25, 2015. Available at: <https://www.iaea.org/newscenter/multimedia/videos/iaea-board-discusses-safeguards-implementation-iran>.

⁸ European Union External Action Service (EEAS), Press Release on the Outcome of the first Joint

mechanism, approves nuclear related procurements by Iran, oversees the Arak reactor conversion and addresses concerns about non-compliance. The Joint Commission has held several meetings in Vienna “to review the implementation of the JCPOA as far as nuclear and sanctions related issues” are concerned.⁹

The Trump administration and the JCPOA

The future of US compliance with the JCPOA witnessed its first tensions during the 2016 presidential campaign when candidate Donald J. Trump called into question the efficacy of the agreement’s restraints on Iran’s potential capability to resume pre-developmental work on a weapons program, its lack of binding restraints on Iran’s missile programs and on its support of proxies in Syria and Lebanon. Since the Obama administration did not submit the JCPOA for Senate advice and consent but implemented it as an executive agreement, opposition Republican congresspersons supported by their Democratic colleagues enacted the 2015 Iran Nuclear Agreement Review Act (INARA) that required the president to certify every 90 days that Iran was in compliance and that US suspension of its sanctions was in the national security interest.¹⁰

UN Security Council resolution 2231 (2015) in its operational paragraphs does *not* contain any restrictions on Iran’s ballistic missile program, however in the “Annex B Statement” by China, France, Germany, the Russian Federation, the United Kingdom, the United States, and the European Union, *which was not negotiated or agreed by Iran*, paragraph 3 states that: “Iran is called upon not to undertake any activity related to ballistic missiles designed to be capable of delivering

nuclear weapons, including launches using such ballistic missile technology, until the date eight years after the JCPOA Adoption Day or until the date on which the IAEA submits a report confirming the Broader Conclusion, whichever is earlier.”¹¹

President Trump certified pursuant to INARA, though reluctantly, in April and July 2017, but in October that year he declined to do so. In May 2017, the US renewed sanctions waivers as required by its JCPOA obligations; the first time the Trump administration had waived sanctions and taken a proactive step to continue US implementation. The other parties of the EU/E3+3 defended the agreement and continue to do so. Iran responded by criticizing the US for violating the JCPOA and rejected US claims that its missiles were capable of delivering a nuclear payload. In May 2017, President Rouhani was elected to a second term as president in Iran.

The Trump administration announced in January 2018 that it was re-issuing waivers on nuclear-related sanctions on Iran in fulfilment of US obligations, but that it would not re-issue the waivers again and would withdraw from the JCPOA. On May 8, 2018, President Trump announced US withdrawal from the JCPOA and the re-imposition of economic sanctions on Iran. The leaders of France, Germany and the UK (E3) reiterated their continuing support for the JCPOA as long as Iran abided by its nuclear obligations, while Iran called on the three countries to implement the agreement even without the United States.

On May 21, 2018, US State Secretary Mike Pompeo announced that Iran had to comply with 12 demands including: declaring to the IAEA a full account of the prior military dimensions of its nuclear program, and permanently and verifiably abandon such work in perpetuity; complete halt of uranium enrichment; destruction of the Arak heavy water reactor; stop its ballistic missile program; and provide unfettered access to the IAEA to all sites anywhere in the country. Should

Commission on the Joint Comprehensive Plan of Action on the Iranian Nuclear Programme. Vienna. October 19, 2015.

⁹ Press Release on the Holding of the Joint Commission of the JCPOA. European Union External Action Service. July 19, 2016.

¹⁰ ‘Iran Nuclear Agreement Review Act of 2015. US Congress, Public Law 114–17 114th Congress. May 22, 2015; The bill passed in the Senate by a 98-1 vote, and then passed in the House by a vote of 400-25 on May 14, President Barack Obama threatened to veto the bill, but eventually there was a version that had sufficient support to override any veto and Obama did not try to veto it.

¹¹ UN Security Council Resolution 2231. 2015. P. 99.

Iran meet these demands, then the US would terminate its sanctions and restore diplomatic and trade relations with Iran.¹²

In September 2018, the EU together with China, France, Germany, Russian Federation and the UK undertook to set up a “Special Purpose Vehicle” (SPV) to facilitate currency transactions for Iran’s exports and imports as well as for foreign commercial entities engaged in legitimate business with Iran. But in November 2018, the United States imposed additional sanctions against Iran. At the end of January 2019, France Germany and the UK established the “Instrument in Support of Trade Exchanges” (INSTEX) to facilitate trade with Iran under the SPV.

The 2019 Worldwide Threat Assessment by the US intelligence agencies assessed that “that Iran is not currently undertaking the key nuclear weapons-development activities we judge necessary to produce a nuclear device. However, Iranian officials have publicly threatened to reverse some of Iran’s Joint Comprehensive Plan of Action (JCPOA) commitments – and resume nuclear activities that the JCPOA limits – if Iran does not gain the tangible trade and investment benefits it expected from the deal... Iran’s continued implementation of the JCPOA has extended the amount of time Iran would need to produce enough fissile material for a nuclear weapon from a few months to about one year.”¹³

In April 2019, the United States stated that starting on May 2, 2019 it would not issue any additional sanctions waivers for States for import of Iranian oil. However, the next day, the United States clarified that it would extend waivers for the conversion of the Arak reactor as well as of the Fordow enrichment facility conversion, the Bushehr nuclear power reactor and the Tehran Research Reactor for 90 days. The United States ended waivers for the transfer of excess LEU from Iran to Russia, the transfer and storage of excess heavy water outside of Iran and the construction of additional power reactor units at Bushehr. This would result

in Iran exceeding the limit of 300 kilograms LEU and 130 MT heavy water allowed by the JCPOA if it continued with production thus placing it in technical violation of the agreement once the limits were exceeded.

In response, in early May 2019, Iran declared that it would no longer abide by the JCPOA limits on LEU and heavy water reserves, it could restart construction on the research reactor at Arak, resume enrichment above 3.67% U-235 in the future if sanctions relief was not forthcoming, and that Iran could even consider withdrawing from the NPT.

Also in early May 2019, the United States sent a nuclear-powered and nuclear-armed aircraft carrier along with a naval task force into the Persian/Arabian Gulf area and announced plans to send additional ground troops, thus significantly ratcheting up tension in the region.

2019 NPT PrepCom and the JCPOA

At the Third Session of the Preparatory Committee for the 2020 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT PrepCom) held at the UN in New York April 29 to May 10, the United States stated that “We must block Iran’s pathways to nuclear weaponry by ensuring it never again engages in weaponization work and cannot dangerously position itself on the brink of Treaty “breakout.”¹⁴ In contrast, the EU “[reiterated] its continued support for the... JCPOA, which is a key element of the global nuclear non-proliferation architecture and an achievement of multilateral diplomacy, unanimously endorsed by UN Security Council Resolution 2231. As confirmed by the IAEA in 14 consecutive reports since Implementation Day, the JCPOA is delivering on its intended goal, which is to ensure the peaceful nature of the Iranian nuclear program, and contributing to regional and international security. As long as Iran continues to fully implement its nuclear related commitments, the EU will remain committed to the continued full and effective

¹² Pompeo M. After the Deal: A New Iran Strategy. Remarks. Secretary of State. May 21, 2018.

¹³ Worldwide Threat Assessment by the US Intelligence Agencies. Office of Director of National Intelligence. January 29, 2019. P. 10.

¹⁴ Statement by the United States in General Debate, Third Session of the Preparatory Committee for the 2020 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapon, The Hon. Christopher A. Ford Assistant Secretary for International Security and Nonproliferation US Department of State. April 29, 2019.

implementation of JCPOA...The EU recognizes that the lifting of the sanctions constitutes an essential part of the JCPOA and deeply regrets the re-imposition of sanctions by the United States, following the latter's withdrawal from the JCPOA.”¹⁵

China, for its part stated that “the JCPOA, as a multilateral agreement already endorsed by the Security Council, should be implemented comprehensively and effectively. Unilaterally withdrawal from and reneging on multilateral agreement, imposition of unilateral sanctions and ‘long-arm jurisdiction’ solely out of one’s own political agenda and in disregard of the shared aspiration and interest of the international community only serve to undermine the international nuclear non-proliferation regime and peace and stability in the Middle East.”¹⁶

And, the Russian Federation stated that “for almost four years since the conclusion of the JCPOA, the Agency has been regularly confirming that Tehran strictly abides to the established limits for the development of the nuclear program, including by proactively providing IAEA inspectors with access to all facilities of interest. Iran’s patience, restraint and responsible approach to fulfilling its obligations, despite constant provocations and blackmail, deserve to be commended and respected. Successful implementation of the JCPOA’s ‘nuclear’ provisions by Tehran is a crucial contribution to strengthening the nuclear non-proliferation regime.”¹⁷

Thus, at the 2019 NPT PrepCom, the United States was alone and isolated in criticizing the JCPOA, though Saudi Arabia and the UAE called upon Iran to fully implement the JCPOA and cooperate with all requests by the IAEA with regard to nuclear verification.

¹⁵ European Union, General Statement by H.E. Mr. Jacek Bylica, Special Envoy for Disarmament and Non-Proliferation, European External Action Service, Preparatory Committee for the 2020 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT). 3rd Session. New York. April 29, 2019.

¹⁶ Statement by H.E. Mr. Fu Cong, Head of the Chinese Delegation at the General Debate at the Third Session of the Preparatory Committee for the 2020 NPT Review Conference. New York. April 29, 2019.

¹⁷ Statement by the Delegation of the Russian Federation at the Third Session of the Preparatory Committee for the 2020 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons (General Debate). April 29, 2019.

IAEA reports and conclusions

With regard to past and present outstanding issues regarding Iran’s nuclear program and nuclear weapons development, in its final assessment of December 2015 the IAEA *inter alia* concluded that:¹⁸

- “Based on all the information available to the Agency relating to nuclear material acquisition, including from the particular verification activities specified under the Framework for Cooperation (including the managed access to the Gchine mine) and the JPA, **the Agency has not found indications of an undeclared nuclear fuel cycle in Iran, beyond those activities declared retrospectively by Iran.** The Agency assesses that any quantity of nuclear material that may have been available to Iran under the AMAD Plan would have been within the uncertainties associated with nuclear material accountancy and related measurements;
- Based on all the information available to the Agency on modelling and calculations, including from the implementation of the Road-map, the Agency assesses that **Iran conducted computer modelling of a nuclear explosive device prior to 2004 and between 2005 and 2009.** The Agency notes, however, the incomplete and fragmented nature of those calculations. The Agency also **notes the applicability of some hydrodynamic modelling to conventional military explosive devices;**
- The Agency’s overall assessment is that **a range of activities relevant to the development of a nuclear explosive device were conducted in Iran prior to the end of 2003 as a coordinated effort, and some activities took place after 2003.** The Agency also assesses that **these activities did not advance beyond feasibility and scientific studies, and the acquisition of certain relevant technical competences and capabilities.** The Agency has **no credible indications of activities in Iran relevant to the development of a nuclear explosive device after 2009;** and

¹⁸ Final Assessment on Past and Present Outstanding Issues regarding Iran’s Nuclear Programme. Report of the Director General, GOV/2015/68. International Atomic Energy Agency. December 2, 2015. Pp. 13-15.

- The Agency has found **no credible indications of the diversion of nuclear material in connection with the possible military dimensions to Iran's nuclear programme** [emphasis added].
- Concerning the implementation by Iran of the provisions of the JCPOA, and its predecessor the Joint Plan of Action, the IAEA *inter alia* concluded that:¹⁹
- Since January 16, 2016 (JCPOA Implementation Day), the Agency has verified and monitored Iran's implementation of its nuclear-related commitments under the JCPOA;
- Iran has not pursued the construction of the existing Arak heavy water research reactor (IR-40 Reactor) based on its original design;
- Iran has not produced or tested natural uranium pellets, fuel pins or fuel assemblies specifically designed for the support of the IR-40 Reactor as originally designed, and all existing natural uranium pellets and fuel assemblies have remained in storage under continuous Agency monitoring;
- Iran has continued to inform the Agency about the inventory of heavy water in Iran and the production of heavy water at the Heavy Water Production Plant (HWPP) and allowed the Agency to monitor the quantities of Iran's heavy water stocks and the amount of heavy water produced at the HWPP – Iran is limited to a maximum of 130 tons of heavy water;.
- At the Fuel Enrichment Plant (FEP) at Natanz, no more than 5060 IR-1 centrifuges have remained installed in 30 cascades in their configurations in the operating units at the time the JCPOA was agreed;
- Iran has continued the enrichment of UF₆ at FEP and Iran has not enriched uranium above 3.67% U-235;
- At the Fordow Fuel Enrichment Plant (FFEP), 1044 IR-1 centrifuges have been maintained in one wing of the facility, of which 1042 IR-1 centrifuges have remained installed in six cascades and two IR-1

¹⁹ Verification and monitoring in the Islamic Republic of Iran in light of United Nations Security Council resolution 2231 (2015). Report by the Director General, GOV/2016/55. International Atomic Energy Agency. November 9, 2016.

- centrifuges have remained installed separately for the purpose of conducting “initial research and R&D activities related to stable isotope production.” Throughout the reporting period, Iran has not conducted any uranium enrichment or related research and development (R&D) activities, and there has not been any nuclear material at the plant;
- All centrifuges and associated infrastructure in storage have remained under continuous Agency monitoring. The Agency has continued to have regular access to relevant buildings at Natanz, including all of Fuel Enrichment Plant (FEP) and the Pilot Fuel Enrichment Plant (PFEP), and performed daily access upon Agency request. Iran has conducted its enrichment activities in line with its long-term enrichment and R&D enrichment plan, as provided to the Agency on January 16, 2016;
- Iran has provided declarations to the Agency of its production and inventory of centrifuge rotor tubes and bellows and permitted the Agency to verify the items in the inventory;
- Iran has continued to permit the Agency to use online enrichment monitors and electronic seals which communicate their status within nuclear sites to Agency inspectors, and to facilitate the automated collection of Agency measurement recordings registered by installed measurement devices. Iran has issued long-term visas to Agency inspectors designated for Iran as requested by the Agency;
- Iran continues to provisionally apply the Additional Protocol to its Safeguards Agreement in accordance with Article 17(b) of the Additional Protocol, pending its entry into force;
- The Agency continues to verify the non-diversion of declared nuclear material at the nuclear facilities and locations outside facilities where nuclear material is customarily used (LOFs) declared by Iran under its NPT Safeguards Agreement. Evaluations regarding the absence of undeclared nuclear material and activities for Iran remained ongoing; and
- Since Implementation Day, the Agency has been verifying and monitoring the implementation by Iran of its nuclear-related commitments under the JCPOA.”

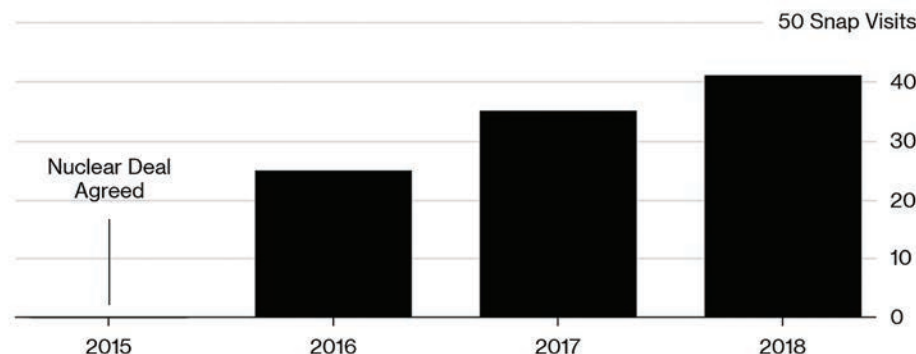
The Agency confirmed that relatively small quantities of heavy water had been shipped out of Iran to the Russian Federation and the United States,²⁰ bringing the stock of heavy water in Iran to below 130 metric tons as required by the JCPOA. Also, Iran sold low-enriched uranium to the Russian Federation to help maintain its limit of 300 kg of UF₆ enriched up to 3.67% U-235.

IAEA inspections in Iran

During 2018, the IAEA expended €17 048 000 for verifying and monitoring Iran's nuclear program including the nuclear related commitments in light of the UNSC resolution 2231 (2015). The Agency utilized 1187 calendar-days in the field to carry out verification and monitoring activities in relation to the JCPOA, including 385 on-site inspections and 41 short-/no-notice inspections, as shown in the infographic below.²¹

Iran Snap Inspections

Monitors conducted more than three surprise visits a month last year



Source: *Iran Snap Nuclear Inspections Jump as Tensions With US Rise*, Jonathan Tirone, Bloomberg News, 10 May 2019.

²⁰ Solomon J. US to Buy Material Used in Iran Nuclear Program // The Wall Street Journal. April 22, 2016; US Department of State, Daily Press Briefing by Mark Toner, Deputy Spokesperson. April 27, 2016.

²¹ Safeguards Implementation Report for 2018. Report by the Director General, GOV/2019/22. International Atomic Energy Agency. May 6, 2019. Pp. 54, 57, 80.

IAEA verification in Iran pursuant to the JCPOA since July 2015 has involved more than 8,000 inspection days and more than 100 short-/no-notice inspections, as well as daily visits to Natanz and Fordow, at a total cost of about €85.5 million.²² The IAEA has prepared the two infographics below on its verification effort in Iran.

KEY DATES



KEY FACTS

18 NUCLEAR FACILITIES & 9 LOCATIONS OUTSIDE FACILITIES UNDER IAEA SAFEGUARDS

ADDITIONAL PROTOCOL

Provides IAEA with **broader access** to information and locations, increasing its ability to verify the peaceful use of all nuclear material in Iran

DAYS IN THE FIELD/YEAR



ANNUAL COSTS



HUMAN RESOURCES

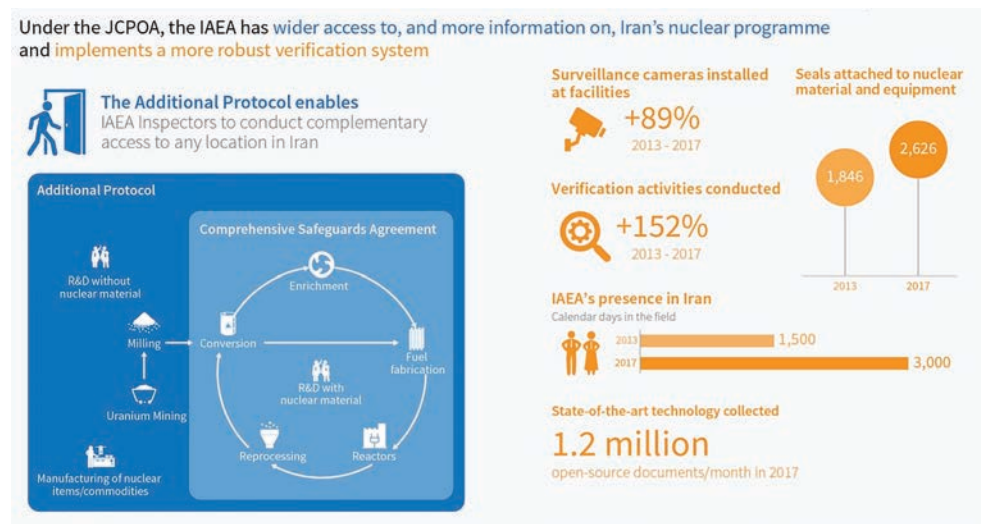


SURVEILLANCE SYSTEMS



Source: IAEA

²² Tirone J. Iran Snap Nuclear Inspections Jump as Tensions With US Rise // Bloomberg News. May 10, 2019.



Source: IAEA

The way forward?

Even though the United States is a permanent member of the UN Security Council and under the principles of international law is legally obligated to honor the provisions of the UN Charter and the decisions of the Security Council, under Article 41 of the UN Charter; as a nuclear and economic superpower it can act if it so chooses without due regard for the UN system and international law, as it has done on numerous occasions in the past and currently with regard to the JCPOA and UNSCR 2231. Furthermore, again as it has done in the past, if the United States chooses to bring pressure to bear upon its Western allies the record shows that they eventually dutifully fall in line echoing the US narrative. However, in the case of the JCPOA, as this agreement is a signal achievement of the EU and its three most powerful member States – France, Germany and the United Kingdom – the United States is chagrined since the EU/E3 continue to defend their major foreign and security policy achievement and have stood up against US pressure. Given the economic might of the United States and the extra-territorial application of its laws, which is illegal under international law, most observers believe that it is only a matter of

time when the EU/E3 will be forced to buckle under and limit or wind up INSTEX/SPV as their major industrial and financial enterprises face crippling US sanctions and penalties.

Given its veto powers in the Security Council, there is no prospect of a resolution calling on the United States to resume its implementation of the JCPOA. And, in the context of the NPT review process, as noted above, the United States opposed the outcome document of the 2019 NPT PrepCom, which operates on the basis of consensus.

In the prevailing construct of the Westphalian State System, where States are sovereign and some States are more equal than others, it is virtually impossible to rein in rogue behavior by a powerful State especially when it is a permanent member of the Security Council – there is no “shining city on a hill,” only reversion to a near Hobbesian state of international affairs.

So what can be done to resolve the situation?

The US' favored option is for Iran to re-negotiate the JCPOA with additional constraints and limitations on its nuclear program including renunciation of enrichment and reprocessing, end its ballistic missile program as well as to rein in its various activities in the Gulf and the Levant regions. These demands are an echo of the Bush administration's position in 2003-2006 of inter alia “zero enrichment in Iran.” Had the US agreed to the E3 (France, Germany and the UK) plan in 2003, when Iran had agreed to suspend uranium enrichment activities—at that time it had less than 200 operational IR-1 machines only 20 of which would operate in a R&D mode under suspension of enrichment, and it had zero stock of enriched product—then there would not have been nearly 20,000 operating centrifuges in 2015 along with some 2 tons of LEU and 200 kg of 20% UF₆ and 5 generations of centrifuges in Iran. No one believes that Iran will give up enrichment short of military defeat and destruction of its nuclear infrastructure, and/or regime change! Given the US' deployment of additional naval and other forces in the region of the Persian/Arabian Gulf, unsubstantiated

(to date) allegations by the US national security advisor of Iranian naval mines damaging four tankers, and heightened op tempo of US naval and air forces in the region, the chances of accidental or pre-emptive war remain high. US allies would be well advised to encourage President Trump, who repeatedly has stated that he does not want a war with Iran, to stick firmly to his position even in the face of bad advice from his senior officials or pressure from Saudi Arabia and Israel. It is interesting that on May 21, 2019, in a Fox News interview, President Trump stated, “And don’t kid yourself. You do have a military-industrial-complex. They do like war”, but then added “We’ll see what happens with Iran. If they do anything, it will be a very bad mistake, if they do anything. I’m hearing little stories about Iran. If they do anything, they will suffer greatly... You do have a military-industrial-complex. They do like war.... They always want to fight. No, I don’t want to fight.”²³ Given the irrational dysfunctional tizzy into which the US political establishment has spun itself into since the election of President Trump, there is scant prospect of the Russian Federation or China to play a stabilizing or restraining role on US military policy in the Gulf region, thus the situation remains unstable and dangerous.

Despite its threats and bravado in its declaratory responses to the US’ renunciation of the JCPOA and re-imposition of national sanctions, the general consensus in the international community suggests that Iran should restrain itself from carrying out rash actions. It is in Iran’s national security interest to continue full cooperation with the IAEA in the implementation by Iran of the JCPOA and its NPT safeguards agreement together with its additional protocol. This means that Iran should *not* exceed the 300 kg limit on 3.67% U-235, nor 130 metric tons of heavy water, and refrain from exceeding enrichment above 3.67% U-235 as well as installation of additional IR-1 and more advanced centrifuges. Furthermore, showing restraint in test launches

of ballistic and cruise missiles would be in Iran’s interest. Iran’s strategy could be based on lasting out the term of the Trump administration which ends in January 2021; however, current trends suggest that likely Trump would be successful in winning re-election in 2020. Iran breaking out of the JCPOA or limiting implementation of the additional protocol would make it impossible for the EU/E3 to continue with their support for the JCPOA and also would lead to Iran losing the moral high ground with regard to the JCPOA.

Proposed measures

Related measures that could be proposed to attempt to lower the current tensions include, for example: ratification by Iran of its additional protocol; conversion of the Natanz enrichment plant into a regional fuel cycle center; supply of LEU to the IAEA LEU Bank; ratification of the Comprehensive Nuclear-Test-Ban Treaty; steps towards establishment of a zone free of nuclear and other weapons of mass destruction (WMD) Middle East NWFZ; and engagement with Iran by the Nuclear Suppliers Group and the Missile Technology Regime.

Admittedly, some or all of these proposals might be considered as either too ambitious or unrealistic; however, this ought not to preclude consideration of ideas both within and outside the “box.”

Ratification of the Additional Protocol

Iran signed the additional protocol to its NPT safeguards agreement on December 18, 2003 and implemented it provisionally until February 2006 pursuant to an agreement with the E3, and resumed provisional implementation under the JCPOA. Iran’s parliament, the Majlis, has held up consideration of ratification pending rescission of all sanctions and pressure against the country. Though under current circumstances this is a big ask, it would stand Iran in good stead to proceed with the ratification of its additional protocol as it has already committed to a peaceful nuclear program and to achieve the full termination of JCPOA limitations Iran needs the broader conclusion from

²³ Trump Says the Military Industrial Complex is Pressuring him Into a War With Iran // The Real News Network. May 21, 2019. Available at: <https://therealnews.com/stories/trump-says-the-military-industrial-complex-is-pressuring-him-into-a-war-with-iran>.

the IAEA. In a “broader conclusion”, which can only be given to a State with an additional protocol in force, the IAEA supplements the safeguards conclusion from the implementation of a comprehensive safeguards agreement that the “Secretariat found *no indication of the diversion of declared nuclear material* from peaceful nuclear activities” with the conclusion that the “Secretariat found *no indication of undeclared nuclear material or activities*” and “on this basis, the Secretariat concluded that *all* nuclear material remained in peaceful activities” [emphasis added]. In the case of Iran, the IAEA concludes that the “Agency continues to verify the non-diversion of declared nuclear material at the nuclear facilities and locations outside facilities where nuclear material is customarily used (LOFs) declared by Iran under its Safeguards Agreement. *Evaluations regarding the absence of undeclared nuclear material and activities for Iran remained ongoing*” [emphasis added]—as the Agency cannot reach a conclusion on the absence of undeclared nuclear material and activities in Iran until and unless it ratifies its additional protocol. In other words, the Agency draws a broader conclusion only where a State has both a NPT comprehensive safeguards agreement and an additional protocol in force; and the evaluations of all available safeguards relevant information and of the consistency of the State’s declared nuclear program with the results of the Agency’s verification activities and with all other available safeguards relevant information has been completed. Thus, Iran is only harming itself and delaying the broader conclusion for its nuclear program by postponing ratification of its additional protocol. Ratification also would strengthen Iran’s non-proliferation credentials under the NPT and the JCPOA/UNSCR2231, as well as with the IAEA and the international community.

Ratification of the CTBT

Iran was the first among the four States of the region of the Middle East—Algeria, Egypt, Iran and Israel—listed in Annex II of the Comprehensive Nuclear-Test-Ban Treaty (CTBT), to sign the treaty

on September 24, 1996; the first day that the treaty opened for signature but has not yet ratified it. Algeria is the only one out of the four to have ratified, while Israel signed on September 25, 1996 and Egypt on October 14, 1996 but neither has ratified.

Again, under present circumstances it would be a big ask to expect Iran to ratify the CTBT, but then doing so would be in Iran’s own national security interest. As noted above, since Iran already has undertaken internationally legally binding obligations not to develop nuclear weapons pursuant to the NPT and the JCPOA/UNSCR2231, postponing CTBT ratification serves only to harm Iran’s international nuclear non-proliferation credentials. In connection with the CTBT’s International Monitoring System (IMS), Iran to its credit already has constructed a *Primary Seismic Monitoring Station*, PS-2, which has been certified by the CTBTO; and two *Auxiliary Seismic Monitoring Stations*, AS-046 and AS-047 have been installed awaiting CTBTO certification; while an *Infrasound Station*, IS-29, is planned, as is a *Radionuclide Station* (including noble gas monitor) RN-36. As a confidence-building measure Iran could construct the two planned IMS stations and complete the certification process for the two installed stations. Thus, as in the case of its additional protocol, Iran’s ratification of the CTBT and certification/completion of its IMS stations would strengthen Iran’s non-proliferation credentials under the CTBT, the NPT and the JCPOA/UNSCR2231, as well as with the CTBTO and the international community.

Furthermore, Iran could take the lead in an initiative to promote either simultaneous or phased ratification by all three Annex II States in the region of the Middle East. This could involve encouraging Egypt to construct its PS-16 and AS-021 seismic stations; in Israel both AS-048 and AS-049 have been certified by the CTBTO as is its *Radionuclide Laboratory* RL-09.²⁴ Thus, universalizing the CTBT in the region of the Middle East as well as completing the network of IMS stations in

²⁴ Station Profiles. Comprehensive Nuclear-Test-Ban Treaty Organization. Available at: <https://www.ctbto.org/verification-regime/station-profiles/>.

the region; and in so doing legally bind the three States not to conduct any nuclear explosions, and for the first time include Israel in a legally-binding nuclear non-proliferation treaty – which should be a significant gain for Iran as well as for the region of the Middle East and globally.

For Egypt, CTBT ratification would imply a third legally binding nuclear non-proliferation treaty, in addition to being a party to the NPT and to the Pelindaba Treaty (establishing a nuclear-weapon-free zone (NWFZ) in Africa).

Breaking from its past reluctance, Israel should ratify the CTBT as doing that would be in its national security interest and an incentive for both Egypt and Iran. In June 2016, Dr Lassina Zerbo, the Executive Secretary of the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), during a visit to Israel was reported to have said that “In [Prime Minister] Netanyahu’s eyes, it’s a matter of when, rather than if Netanyahu did not commit to any specific time-frame but this is normal in diplomacy.” Prime Minister Netanyahu announced after the meeting that “Israel supports the treaty and its goals; thus, we will ratify it,” and emphasized that the ratification is dependent on the regional context and the appropriate timing.²⁵

Middle East NWFZ/WMDfZ

Proposals to establish a NWFZ in the region of the Middle East can be traced back to 1974 and of a WMDfZ to the 1995 NPT Review and Extension Conference (NPTREC) “Resolution on the Middle East”, although Egypt had proposed it earlier. Without recalling past efforts dating back to 1995, suffice it to note that in November 2018, the UNGA First Committee adopted by voting (103 yes :3²⁶ no : 71) decision (A/C.1/73/L.22/Rev.1) co-sponsored by a number of Arab

Group States on *Convening a conference on the establishment of a Middle East zone free of nuclear weapons and other weapons of mass destruction*. The decision called on the UN Secretary General, *inter alia*, to, “convene a conference for the duration of one week to be held no later than 2019 dealing with the establishment of a Middle East zone free of nuclear weapons and other weapons of mass destruction.” This conference will be held on November 18 to 22, 2019 at the UN in New York under the presidency of Jordan, to which all States of the region of the Middle East are invited, none is excluded, and all decision-making shall be by consensus. The United Kingdom has voiced support for the vision of a MEWMDfZ but has not yet decided whether to attend the November conference; the Russian Federation has endorsed the convening of the conference and has signaled its intention to attend the conference which it regards as easing pressure at the 2020 NPT review conference; while the US has indicated support for the goal of a Middle East free of WMD based on direct dialogue and consensus but reportedly will not attend the conference. While Israel has not indicated its intention to attend, it is expected that it will announce its intention to attend at the very last minute?

Though Iran was the original proponent in 1974 of setting up a NWFZ in the Middle East and has supported the zone in the NPT review process, it did not take part in multilateral consultations on the matter held in Switzerland in 2014–2015 reportedly due to being occupied with the negotiation of the JCPOA. Iran’s active participation in the November 2019 UN conference on the Middle East zone could be a positive move, demonstrate its commitment to achieving a region free of nuclear and other weapons of mass destruction, and reaffirm its commitments under the NPT and the JCPOA. Should there be agreement on a treaty on establishing a NWFZ/WMD-free-zone in the Middle East, Iran would be bound by four non-proliferation agreements – NPT, CTBT, JCPOA/UNSCR2231, MEWMDfZ.

²⁵ Noy B. UN Official: Netanyahu Contemplating When, Not If, to Sign Treaty Banning Nuclear Tests // Jerusalem Online. June 20, 2016. Available at: <https://www.jerusalemonline.com/un-netanyahu-ready-to-turn-middle-east-into-nuclear-test-free-zone-21821/>.

²⁶ Israel, Micronesia, the United States.

Regional nuclear fuel cycle center

Pursuant to the JCPOA, Iran's uranium enrichment plant at Fordow is being converted into a nuclear, physics and technology center, involving international collaboration including in the form of scientific joint partnerships in agreed areas of research, and the centrifuge cascades are to be transitioned through appropriate infrastructure modification for stable isotope production.

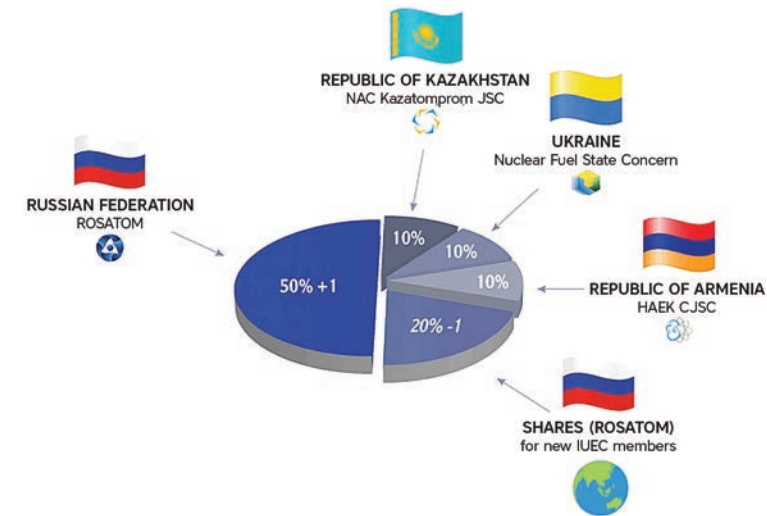
In October 2003, Mohamed ElBaradei, then-Director of the IAEA, proposed that all new enrichment and reprocessing plants should be operated only under multinational arrangements and that existing ones should be converted to multinational operations, as well.²⁷ This led to a number of proposals on assurances of supply of nuclear fuel, ranging from international centers to nuclear fuel reserves.²⁸ There have been suggestions that Iran could convert the Natanz Fuel Enrichment Plant (FEP) into a multinational consortium for the production and sale of reactor grade enriched UF₆, at enrichment levels up to 5% U-235 which would cover the fuel requirements of existing types of light water power reactors. Conversion of the Natanz FEP into a multinational enrichment center could serve as a Regional Fuel Cycle Centre (RFCC)—which has been considered in the past at the IAEA for assurance of supply mechanism on a regional basis.²⁹ Another variation could be along the lines of the International Uranium Enrichment Centre (IUEC) at the Siberian Electrochemical Complex at Angarsk in the Russian Federation. The IUEC was originally established by the Russian Federation and Kazakhstan, but includes Armenia and Ukraine as shown in the infographic below. The IUEC model is instructive as Ukraine continues to be a partner even though its relationship with the Russian Federation is fraught given the crisis over Crimea. Conversion of the Natanz FEP into an IUEC could potentially bring in Saudi Arabia, the UAE and Egypt as partners, even though the three

²⁷ See Rauf T., Vovchok Z. A Secure Nuclear Future. IAEA Bulletin, 51-1. September 2009.

²⁸ Ibid.

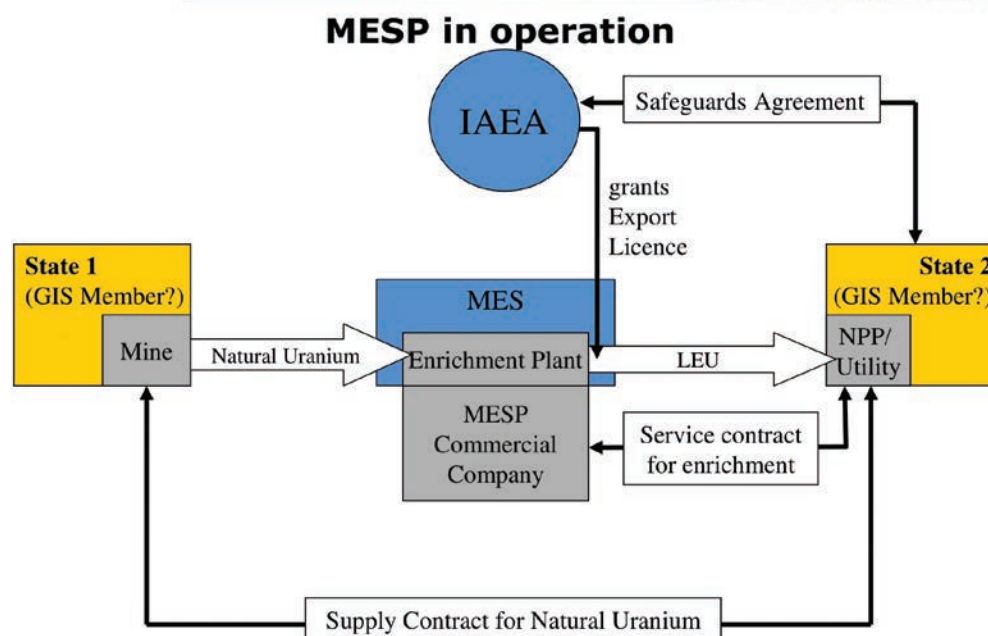
²⁹ See, Regional Fuel Cycle Centers, 1977 Report of the IAEA Study Project.

Arab countries presently are at loggerheads with Iran. But, they could be reassured of Iran's enrichment facility being utilized for production of reactor grade LEU if they were partners in a Natanz IUEC. Such a proposal could be floated by the EU/E3 as a way of calming tensions over Iran's nuclear program.



International Uranium Enrichment Centre (IUEC), Angarsk – division of shareholdings. Source: IUEC.

Yet another model is the Multilateral Enrichment Sanctuary Project (MESP) proposed by Germany in April 2007, which remains on the books as a proposal to be taken up under IAEA auspices. MESP envisages being a commercial enterprise owned and operated by an international company, founded by States and their nuclear energy authorities or industries interested in having a reliable and independent supply of nuclear fuel. Converting Natanz FEP into a MESP would necessitate Iran giving “international status” to the entire site, along the lines of an embassy or an international organization, and placed under the sovereign control of the founding entity with privileges and immunities; and with Iran retaining ownership and control of centrifuge technology but the founding entity would be in control of all commercial operations under IAEA oversight. The two infographics below show the proposed organizational structure of a MESP.



Source: Federal Chancellery, Germany.

Conversion of the Natanz FEP into an IUEC or a MESP could serve as a RFCC for the region of the Middle East and could supply low enriched uranium (LEU) to nuclear power plants (NPPs) not only in Iran but also in the UAE and Saudi Arabia, as well as to Egypt and Jordan when they construct NPPs. A Natanz RFCC could be a major confidence-building measure with respect to the peaceful uses of nuclear energy in the region of the Middle East, reduce or eliminate incentives to set up nationally controlled enrichment plants in the region, and strengthen multinational approaches to the nuclear fuel cycle thus contributing to non-proliferation efforts.

Iranian LEU for IAEA LEU bank

Several years ago, it was suggested to Iran to donate or sell low enriched uranium (LEU) produced at the Natanz FEP to the IAEA for deposit in the IAEA LEU Bank to be set up at the Ulba Metallurgical Plant (UMP) at Oskemen Ust-Kamenogorsk) in Kazakhstan, but Iran was not responsive. The crisis over the JCPOA could provide another

opportunity for Iran to earn goodwill by sending its LEU to the IAEA LEU Bank, as now the US has sanctioned Iran from sending LEU to the Russian Federation. Should Iran announce that it would now send its LEU to the IAEA LEU Bank, a project to which the US under the Bush administration has contributed nearly US\$ 50 million and the EU € 25 million, that would place the Trump administration in a quandary and would be an initiative that the IAEA Board of Governors would be hard pressed to decline as that would place the Agency in violation of its own Statute. Furthermore, it would help dig the current IAEA leadership out of a hole of its own making as it has grossly mismanaged the LEU Bank project over the past seven years and has not yet been able to place any LEU in Bank storage at the UMP.³⁰ Iranian LEU could be the first deposit of LEU in the IAEA Bank, thus not only preserving the JCPOA but also supporting the IAEA.

Engagement with the NSG and MTCR

A more novel and challenging approach might be for the participating governments (PGs) of the Nuclear Suppliers Group (NSG) and the “partners” of the Missile Technology Control Regime (MTCR), to find ways of engaging with Iran on its nuclear and missile programs. It cannot be denied or wished away that Iran has mastered uranium enrichment technology and potentially would be in a position to export this technology as well as enriched uranium product. As a State party to the NPT, Iran is party to an internationally legally binding non-proliferation agreement, and as a signatory to the CTBT it is obligated not engage in actions to undermine that treaty. Thus, Iran does comport with two key “factors” that the NSG considers with respect to participation—in several respects, Iran would be a more suitable new “participating government” as opposed to India which is favored by many PGs; even though India is a serial violator of its peaceful use

³⁰ See In Perspective: IAEA Fuel Bank – Unanswered Questions // Nuclear Intelligence Weekly. January 4, 2019; Rauf T. From ‘Atoms for Peace’ to an IAEA Nuclear Fuel Bank // Arms Control Today. October 2015.

commitments when it carried out two rounds of nuclear tests in 1974 and 1998, an opponent of the CTBT and non-party to both the NPT and the CTBT, its additional protocol is meaningless as it does not give the Agency an iota of extra verification, and has made countries such as Australia and Canada in violation of non-proliferation obligations through their supply of uranium to India.

Iran also is manufacturer of ballistic and cruise missiles, including “complete rocket systems (including ballistic missiles, space launch vehicles and sounding rockets) and unmanned air vehicle systems (including cruise missiles systems, target and reconnaissance drones)” as listed in the MTCR “guidelines.” Thus, “member” States of the MTCR could consider engaging with Iran on MTCR “guidelines” and confidence-building measures, as well as outreach to help address concerns about Iran’s missile program.

Now there is no reason for NSG and MTCR adherent States to express shock and anger at such a proposal, after all both groups already are riddled with contradictions and double-standards and in engaging with Iran one might recall Macbeth’s lament, “*What does, I am in blood stepped in so far that should I wade no more, Returning were as tedious as go o’er*,” (*Macbeth*: Act 3, Scene 4, with apologies to Shakespeare).

THE IMPERATIVE OF COOPERATION BETWEEN RUSSIA AND THE UNITED STATES

*Igor Ivanov*¹

In contemporary history, relations between the Soviet Union, and subsequently Russia, and the United States have always been cyclical in nature: times of crises have alternated with years of constructive cooperation that have always had a positive influence on the global situation overall.

The relationship between our two countries is currently mired in what is probably one of its worst crises, one that has been ongoing for a few years already with still no way out in sight.

It is sometimes asked whether the relationship between Russia and the United States has hit rock bottom. I am sure that both Moscow and Washington understand perfectly what devastating consequences any further escalation in confrontation between them would have for both our two countries and for the world as a whole. Both countries showed they understood this during the Cold War, and this helped to maintain global strategic stability, albeit only to a limited extent. Let us hope that this will also be the case today.

But this is no reason for complacency. The great Notre Dame de Paris, which for centuries was admired by people from all over the

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world, was engulfed in flames in a matter of minutes. No one expected this. Nobody believed it could happen. But it did.

Today's world looks even less well protected and more vulnerable in terms of security than Paris' Notre Dame cathedral.

Our world's leading experts, scientists and prominent politicians are constantly warning us about the threat of a nuclear disaster. A great deal of work is being done in this regard by the International Luxembourg Forum on Preventing Nuclear Catastrophe, which develops concrete proposals and recommendations on key issues of nuclear security.

Unfortunately, we must recognize that, despite all these warnings, security threats, including nuclear threats, continue to grow.

The world in which we live is changing before our eyes, including in the field of international security. It is becoming more complex, less predictable and potentially more dangerous.

First of all, the threats to security themselves have changed: their nature, character and vectors have changed. Alongside increasing terrorist activity, cyber-warfare is becoming a reality, and the world is being drawn into a new arms race, which may lead to the emergence of fundamentally new means of destruction. Some experts, for example, presage serious threats associated with the development of artificial intelligence and many other forms of technological progress in the XXI century.

In addition, and perhaps most importantly, the entire system of global governance has been thrown into turmoil, at different levels and in different areas. The role of international institutions is declining, fundamental principles of international law are being violated everywhere, double standards and information warfare are being used, protectionism is reappearing in international trade, and sanctions of various kinds are becoming a permanent attribute of world politics.

In these circumstances, to speak of trust, transparency and predictability in the military field is no longer possible. Everything is

sliding in the opposite direction, with each international player thinking mainly or exclusively about their own immediate security preferences, with little or no regard for global security, which is placed on the back burner.

Equally alarming is the fact that some politicians and experts are beginning to describe the current state of affairs in the world as almost natural, one that allegedly reflects the inevitable costs stemming from the emergence of a new type of world order in line with the realities of the XXI century. At the same time, it is becoming almost fashionable to talk about the end of the era of nuclear deterrence, and about the permissibility of local use of nuclear weapons under certain conditions. Such views appear particularly dangerous at a time when the line between nuclear and conventional weapons is becoming increasingly blurred, and when it is becoming increasingly difficult to prevent a qualitative arms race.

The sharp deterioration of the situation around Iran, the conflicts in Syria, Yemen, and Libya, and the lack of any visible progress on the settlement of the Ukrainian crisis – all these and other disturbing events in recent years may actually portend even greater and more devastating upheavals that could threaten the contemporary world. It must be recognized that we have made no progress whatsoever in terms of solving any of these problems, some of which are still worsening.

Restoring governability over world politics is a common task for all countries, as the world's growing chaos is affecting all countries without exception. Yet Russia and the United States still bear a special responsibility for maintaining international security. And there are good reasons why.

First, Russia and the United States remain the only powers in the world capable of repeatedly destroying each other and the rest of humanity in a suicidal nuclear war. Therefore, the issues of nuclear disarmament, non-proliferation and prevention of nuclear terrorism fall first and foremost on their shoulders.

Secondly, Moscow and Washington, for a number of historical, geographical, economic and other reasons, are almost inevitably involved in the most acute problems of our time. Suffice it to mention the Middle East, Afghanistan and the Korean peninsula. The global “arc of instability” passes through zones that are of vital interest to our two nations.

Thirdly, our countries are at the epicentre of many global problems: from energy and the environment to cyberspace and outer space. Without mutual understanding and cooperation between the two countries, any progress in these areas will be very difficult, if not impossible.

If we take into account all these fundamental elements, it becomes obvious that, in the current crisis of international relations, dialogue between Russia and the United States is more necessary than ever, because without this dialogue, it will be simply impossible to agree on any of the issues that affect the vital interests of our countries.

The need for this dialogue to resume is now being discussed both in Moscow and Washington. And that is good! The meeting that took place between Presidents Putin and Trump on the June 28, 2019, on the sidelines of the G20 in Osaka is cause for a certain amount of optimism.

That said, we should not expect any breakthrough in relations between our countries any time soon. For now, there is no reason for there to be any such breakthrough. There is very difficult work ahead. After all, we are not starting this work from a clean slate, but with the burden of the accumulated problems, mutual distrust and suspicion of recent years. And efforts will only succeed if there is political will at the highest level on both sides – the will to build equal relations in key areas of global politics.

Therefore, as we embark on this task, it seems important to answer the question: are Russia and the United States of America irreconcilable opponents today, or can they still be partners despite

all of their possible disagreements? This is far from being an idle question. At the turn of the century, Russia and the United States of America, Russia and NATO declared that they were partners and would jointly counteract global challenges. However, in recent years, we have again begun to treat each other almost as enemies.

If we come to the conclusion that we are inexorably adversaries – an undesirable conclusion, but which can’t be ruled out, – then the main task will be to work out and agree on mutually acceptable “rules of the game” for what will be a long and hostile confrontation. These rules should serve to minimize, in the event of a conflict situation, the risks of direct Russian-American confrontation that would threaten international security, and to leave the door open for interaction. They should also seek to reduce, to the extent possible, the political and economic costs of the antagonism for both sides.

If, on the other hand, Russia and the United States are ready to work together as partners in the interests of tackling global challenges, then appropriate forms of dialogue should be established at all levels, from the highest level to specific agencies and civil society, so that our relations are open and predictable. This would make it possible, in case of disagreements which are only natural in our relations, to overcome them in a spirit of mutual respect, preventing them from escalating into an acute crisis.

Russia and the United States do not have and are unlikely to have a common perspective on the fundamental trends in global development, the driving forces behind this development, the future of the world order, the fate of leading international organizations, etc. Our countries have deep differences in their understanding of what is “legal,” “fair,” “ethical” and “responsible” in global politics. In this sense, the “values gap” between the Russian and American political elites runs deep indeed.

What, then, can be categorized as “possible” in this relationship? To answer this question, we should turn to those areas of international relations where Russia and the United States will continue to

play a significant role in the foreseeable future, and where without mutual cooperation each side will face growing problems.

Despite different ideas about the future world order, Russia and the United States have no interest in the collapse of the current world order. Both powers remain essentially conservative players, generally focused on maintaining the global status quo. This is not by chance. In the new world order, whatever form it takes, the roles of Moscow and Washington will be less significant than they are now.

Russia and the United States have and will continue to have a common desire to avoid nuclear conflict. Despite the importance of third-country nuclear arsenals, today, as during the Cold War, there are only two nuclear superpowers. And this situation will persist for a long time to come.

Russian and American interests also coincide with regard to countering WMD proliferation and combating international terrorism.

In an article published last April in the *Wall Street Journal*, prominent American politicians J. Schultz, William Perry and Sam Nunn, expressed their concern about a possible direct nuclear confrontation between Russia and the United States and proposed a number of measures to address the situation.

First, they suggest that Trump and Putin should issue a joint statement that there can be no winners in a nuclear war, and that therefore it may not be fought. Confirmation of this truth would send a signal not only to the military and diplomatic corps of Russia and the United States, but also to the international community as a whole, which is particularly important in the run-up to the NPT Review Conference next year.

Second, Russian and American leaders could task the relevant agencies with launching a serious dialogue on strategic stability issues in the new conditions of the XXI century. The range of issues for bilateral discussions is extremely broad, it includes the role of

new technologies, the reduced flight time of nuclear missiles, and non-proliferation.

The proposals of the American statesmen are addressed first of all to the political elite of the United States, but they deserve attention in Moscow as well. We can indulge in long debates with the United States about the reasons for the current situation, and we can disagree as to which side bears the main responsibility for the growing threat of nuclear confrontation. But it is hard to disagree with the general conclusions of the article. Just as it is difficult to find convincing arguments against the steps identified as priorities by the authors.

Another important and extremely topical issue in US-Russia relations is the fate of the Treaty on further Reduction and Limitation of Strategic Offensive Arms (the New START). Russia and the United States need to reach an agreement by September 2020 on extending the treaty. If this cannot be done, the Treaty will expire *de facto* as early as September 2021, and it will expire *de jure* 6 months later, leaving us with no treaty limiting nuclear weapons at all.

As President Putin pointed out: “If this treaty also ceases to be, then basically the world will have no instruments whatsoever to hold it back from an arms race. And that is bad!” Trump recently announced that he would like to conclude a new strategic offensive arms treaty involving the US, Russia and China. This sounds tempting, but in the foreseeable future this proposal stands no chance of success. There simply isn’t enough time to develop a new treaty, and ratification by the US Congress would be improbable given its current configuration. Besides, China is not ready to discuss this topic either. Therefore, it is necessary to set a more realistic goal: to seek the extension of the existing bilateral treaty whilst gradually engaging with the Chinese in a serious discussion on how to strengthen strategic stability.

When thinking about the future of US-Russia relations, it is useful to look back at the experience of the “reset” policy during

President Obama's first term. After all, a lot was done then in the interest of bilateral cooperation in several fields, including security, in just a few years. Suffice it to say that Presidents Medvedev and Obama signed the Treaty on Measures for the Further Reduction of Strategic Offensive Arms (New START) in April 2010. That notwithstanding, at the end of the Obama administration's term, the relationship between Russia and the United States was at its lowest point since the early days of the Cold War.

Of course, either side can be blamed for mistakes and miscalculations. However, the historical defeat of the "reset", in my view, has deeper, more systemic causes. After the end of the Cold War, Moscow and Washington focused on solving problems that, though very important, were still limited or specific in scope, without paying due attention to developing and articulating new set of basic principles for their relations that would reflect the strategic interests of the two countries in a world that had undergone fundamental changes. As a result, individual achievements failed to take our relations to a qualitatively new level, nor did they create a much-needed safety margin, and therefore the "reset" did not withstand the test of international crises – primarily the crisis in Ukraine.

This leads us to the main conclusion for the future: while addressing important current issues, it also is necessary to simultaneously start a serious discussion on the strategic interests of the two countries, on the real opportunities and objective limitations of bilateral cooperation. When I was Secretary of the Russian Security Council, we tried to engage the administration of George Bush Jr. in such an effort, but nothing concrete was achieved at the time. However, this does not mean that this task is not of fundamental importance.

Therefore, alongside contacts at the official level, it is extremely important to create without delay a non-governmental expert council, bringing together prominent politicians, former diplomats and military experts on bilateral relations. Within the

framework of this council it would be possible not only to reduce the degree of mutual distrust, but also to start a serious discussion on the foundations and principles of bilateral relations for the future. It would also be useful to establish a bilateral business council with the participation of representatives of large private businesses from both countries.

In other words, the more the tracks available for dialogue, the better the chances of understanding each other and finding common ground.

In this regard, I would like to point out that recently, there has been a noticeable sense of doomsday hopelessness in the statements of some Russian experts with respect to the future of relations with the United States. Allegedly, we have done everything we could to preserve cooperation with the United States. We have tried all options and put forward all possible proposals. Now we have to wait until the anti-Russian hysteria in Washington stops and more realistic politicians prevail.

Such an approach would probably be justified if less important matters were at stake. But this wait-and-see stance in the context of a growing threat of global nuclear conflict is not just short-sighted. It is also deeply immoral. History will not forgive us such procrastination.

Historically, new rules of the game have tended to take shape in world politics and economics in the aftermath of great crises and upheavals – be it the period of Napoleonic wars in Europe in the early XIX century, the Great Depression of the late twenties and early thirties of the last century or the Second World War of 1939-1945. Some analysts argue that this could not be otherwise – humanity embraces radical change only under the pressure of exceptional circumstances, when it becomes clear to everyone that the old way of life is no longer tenable.

The problem, however, is that modern civilization is so complex, fragile and vulnerable that another global upheaval may

prove too much for it. Together we must seek other, less costly and less risky mechanisms with which to make the transition.

And, of course, no one should be under the illusion that everything can be solved very quickly and easily. Resolution of the current crisis in the US-Russia relations is not a very immediate prospect. The immediate task should be to change the dynamics of the relationship from negative to positive.

