PIR LIBRARY SERIES

Global Security:
A View from Russia for the Youth Around the World

NUCLEAR NONPROLIFERATION AND ARMS CONTROL

DIGITAL PAPERS

Moscow
2024

SUPPORTED BY PRESIDENTIAL GRANTS FOUNDATION

PIR CENTER Non multa, sed multum 1994-2024

PIR Library Series № 36

Academic Director:
Dr. Vladimir Orlov, Founding Director, PIR Center; Professor, MGIMO University

Executive Editor:
Elena Karnaukhova, Deputy Director – Education and Training Program Director, PIR Center

Reviewer:
General Evgeny Buzhinsky, Chairman of the Executive Board, PIR Center

The textbook *Nuclear Nonproliferation and Arms Control. Digital Papers* has been prepared under the auspices of PIR Center project *Global Security: A View from Russia for the Youth Around the World* with support of the Presidential Grants Foundation.

ISBN: 978-5-6051623-1-5

Nuclear Nonproliferation and Arms Control. Digital Papers / Vladimir Orlov and Elena Karnaukhova (Editors). PIR Library Series № 36. PIR Center, 2024

Editorial work was completed on February 29, 2024.

The textbook *Nuclear Nonproliferation and Arms Control. Digital Papers* is available for downloading from PIR Center website.

First PIR Center Online Course on Nuclear Nonproliferation and Arms Control is available at PIR Center educational and training platform NONPROLIFERATION.WORLD.

Find more at PIR Center website: www.pircenter.org

PIR Center Telegram Channel in Russian @ Ядерный Контроль

PIR Center Telegram Channel in English @ Russian Security Index

2024

CONTENTS

FOREWORD

In commemoration of the 30th Anniversary of PIR Center (1994-2024)

The textbook *Nuclear Nonproliferation and Arms Control. Digital Papers* was prepared in 2023-2024 by PIR Center under the auspices of the educational project *Global Security: A View from Russia for the Youth Around the World* with support of the Presidential Grants Foundation.

The Papers were designed as a preparation to, and a continuation of the First PIR Center Online Course on Nuclear Nonproliferation and Arms Control. We are in no doubt about their topicality and significance for the youth (but not only for them) around the globe.

While preparing the textbook *Nuclear Nonproliferation and Arms Control. Digital Papers*, we were motivated by the following factors. First of all, nowadays we are facing the unprecedented level of international tensions. The modern architecture of international security is being put under pressure. There are also many talks about the crisis of the existing international organizations. But how do these trends affect international regimes in general and the international regime of nuclear nonproliferation as a part of the global security architecture?

For many years we have been observing the degradation of the military-political situation on the regional and global levels. There are still many hotbeds of tensions which can turn into nuclear disasters. We cannot rule out an apocalyptic scenario in the context of such trends as lowering of nuclear threshold, miniaturization of nuclear weapons, restoration of the limited nuclear war concept, etc. The arms control regime is being disrupted, which can entail a new phase of nuclear proliferation and a new arms race, this time a multilateral one. Right now, even strategic stability talks are non-existent. Shall we be able to restore arms control and strategic dialogue to prevent nuclear escalation?

The development of the 1968 Treaty on the Non-Proliferation of Nuclear Weapons (NPT) seems to be yielding no results. The two previous conferences on the NPT operation ended in the atmosphere of mutual accusations, whereby no final documents were adopted. Will the states demonstrate their ability and readiness to conduct impartial, mutually respectful dialogue to eliminate all the threats and challenges in the nuclear field?

We hope that this new digital textbook will help you to find your own answers and raise new questions. The *Digital Papers* are intended for a wide foreign English-speaking audience of diplomats and government officials, journalists, employees of research centers and institutes, instructors and students, functionaries of public organizations dealing with international cooperation and public diplomacy, as well as all those who are simply interested in the nuclear domain or adhere to the principle of *life-long*

learning. It will also be of interest to Russian specialists who would like to develop their professional vocabulary and conceptual system in English. There is no distinction as to race, nationality, language, age, or gender, as nuclear issues concern all humanity. A deeper understanding of all the nuclear risks and threats helps us lay the groundwork for a safer and more stable future for all mankind.

Besides, over the last few years Russia has been frequently reproached for *not observing* the basic conditions of the nuclear nonproliferation and arms control regimes. The role of Soviet and Russian specialists in providing the nuclear nonproliferation regime and arms control has been just as frequently downplayed. The official position of Russia on nuclear aspects of global security is being distorted or withheld, which causes misinformation about Russia, its foreign and defense politics to develop into false convictions and affects the international situation. We want the voice of the Russian experts to be heard, we want other countries and nations to be sure: Russia is and has always been a reliable player on the international arena and a staunch supporter of equal and indivisible security.

To make our *Digital Papers* more diverse, comprehensive, and versatile, offering different perspectives on issues, we invited many Russian experts with different professional background and experience, views, and opinions. Advantageously, the authors of the *Digital Papers* include reputable Russian experts who scored weighty results in their professional field, as well as beginning specialists in nuclear nonproliferation and arms control who aspire to make their contribution to the analysis of recurring problems in the nuclear sphere.

Thanks to our authors you will have an opportunity to get acquainted with the theoretical approaches to the study of nuclear nonproliferation and arms control regimes, their history, and, of course, the current challenges and threats in all three pillars of the NPT, i.e., nonproliferation, disarmament, and peaceful uses of nuclear energy. The textbook *Nuclear Nonproliferation and Arms Control. Digital Papers* includes **five key units** and **21 papers**.

The **Introductory Unit** is dedicated to the theory of international regimes. Together with **Dr. Igor Istomin** you will dive into the general provisions of the theory of international regimes, their nature, formation and disintegration, advantages, and disadvantages. Also, you will find his views on the uniqueness of nuclear nonproliferation and arms control regimes from the standpoint of international relations theory.

The papers 2-6 of Elena Karnaukhova and Dr. Vladimir Orlov in Unit I focus on the historical aspects of the development of the nuclear nonproliferation regime, the provisions of the NPT, the NPT review process (using the example of the 1995 NPT Review and Extension Conference and the 2022 10th NPT Review Conference). Special attention is paid to the review of the current challenges and threats in all three pillars of the NPT: nuclear nonproliferation, nuclear disarmament, and peaceful uses of nuclear energy.

Unit II offers more details on the most pressing issues of nuclear nonproliferation. **Paper 7 by Daria Pakhomova** examines the nature of nuclear-weapon-free zones and pays special attention to the difficulties of the establishment of the Middle East WMD-free zone. In

Paper 8 Elena Karnaukhova and Igor Vishnevetsky scrutinize the international mechanisms of exports control. **Papers 9-10 by Adlan Margoev and Dr. Alexander Vorontsov**, respectively, deal with the situation around the Iranian nuclear program and the issue of denuclearization of the Korean Peninsula, from the historical roots of the problems to the current state of affairs. The Unit ends with the **Paper 11 by Sergey Semenov** that addresses the factors and current trends which could lead to a new wave of nuclear proliferation in the world.

The authors of **Unit III** speak to the reader frankly about the situation in arms control and touch upon the subject of nuclear disarmament. In his **papers 12 and 14 Dmitry Stefanovich** addresses the historical aspects of the nuclear arms control regime, the technological and geopolitical factors of its collapse as well as the problem of the resuming nuclear testing and maintaining nuclear tests moratorium. **Paper 13** was superadded to the Unit, and it tells the reader about the 2010 New START based on the Russian-language monograph of **Ambassador Anatoly Antonov** who had headed the Russian-American talks on the Treaty in the context of the reset between the two countries in 2009-2010. **Paper 14 by Dr. Elena Chernenko** is another valuable add-on to the Unit, as it allows the reader to get a better idea of the connection between strategic stability and cybersecurity using the example of Russian-American interaction in the sphere. **Dr. Andrey Malov in his Paper 16** provides a comprehensive analysis of multifeatured formats of nuclear disarmament and writes of the main obstacle on the way to the *nuclear zero*, as well as of verification issues. Unit III ends with **Paper 17 by Dr. Dmitry Trenin**, where the author covers some of the most sensitive issues of the current nuclear agenda, i.e., nuclear deterrence, fear of nuclear weapons, and the use of nuclear weapons.

Unit IV concentrates on the issues of peaceful uses of nuclear energy appealing to international law and physico-technical approaches. There you can find **papers 18-21** by **Dr. Mikhail Lysenko, Vladimir Kuchinov, Dr. Alexey Ubeev, Gleb Efremov** offering a lot of supporting data and profound analyses of the current state and prospects of international cooperation in the sphere of peaceful atom, as well as Russia's approaches, the basics of IAEA activities and functioning, the specifics of nuclear safety and nuclear security, features of the international uranium market and its players.

Each paper is in fact rich in useful supporting data, such as excerpts from official documents, statements of officials, memoirs, mass media reports, statistical data, even maps and cartoons. Thus, the *Digital Papers* provide sufficient food for thought. There are also reliable references to literature and external information sources – please find them in the footnotes. Most provided link refers the reader to Internet publications highly recommendable for a better grasp of the subjects. Also, please refer to the website of PIR Center and our educational platform NONPROLIFERATION.WORLD for more texts and videos on nonproliferation, arms control and global security, etc. – all the materials PIR Center has been accumulating since its foundation in 1994.

This year PIR Center turns 30, and the publication of *Nuclear Nonproliferation and Arms Control. Digital Papers* is dedicated to this anniversary. We put all our experience and expertise in the work and now share it with our readers. Since its foundation date, April 30, 1994, PIR Center has been loyal to its mission of educating new generations of experts, analyzing international processes, providing a better understanding of Russia's

foreign and defense politics, maintaining an international dialogue on nuclear nonproliferation, arms control and global security. We shall remain loyal to the mission in the new decades to come.

Have a wonderful intellectual trip to the world of nuclear nonproliferation and arms control! Whether or not you already are specialists in nuclear domain-related issues, whether or not you agree with the positions, views and thoughts expressed by our authors, we are convinced that the history and current problems of the international nuclear agenda will not leave you indifferent.

The editorial staff of the textbook Nuclear Nonproliferation and Arms Control. Digital Papers would like to give the words of gratitude to all our authors as well as the following people for their great contribution to preparing the Digital Papers: Anton Anufriev, Asya Arakelyan, Ksenia Mineeva, Veronika Terpugova, Anatoly Shchekin, Grace Smith.

Dr. Vladimir Orlov, Elena Karnaukhova
February 2024

INTRODUCTORY UNIT

PAPER 1.

THEORIES OF INTERNATIONAL REGIMES AND THEIR APPLICATION IN SECURITY STUDIES

Igor Istomin

The current international society comprises an elaborate and thick set of legal rules, informal norms, organizations, and practices, which combinedly establish its regulatory frame. The origins of the existing patchwork of institutions date back to the 19th century. For example, diplomatic privileges were first codified on the European level at the Vienna Congress of 1815. The Danube River Commission established in 1856 posed as the oldest standing international organization. Universal Postal Union emerged a couple decades later and persists until today.

The rise of international regulations and associated bodies accelerated after World War I (1914–1918) with the establishment of the League of Nations and related institutions such as the International Labor Organization. However, the greatest share of currently applicable international norms and institutions proliferated after World War II (1939–1945) under the auspice of the United Nations. One prominent example of organizations which emerged in this timeframe was the International Atomic Energy Agency (IAEA) created in 1957.

Such institutionalization in international relations inspired the advancement of regime theory as a separate academic subdiscipline. Its purpose is to explain the sources, evolution, and the meaning of international regimes.

INTERNATIONAL REGIME THEORY: GENERAL OVERVIEW

There are significant disputes among scholars on the most fundamental premises of regime theory. Historically, the evolution of research on regulation in international relations proceeded in several stages.

It started with *deontological writings* of international lawyers. Their approach focused on the necessity of establishing regulatory constraints on political struggle based on the moral grounds. Hugo Grotius, who worked in the 17th century, is considered the founder of this approach. His book *On the Law of War and Peace* prepared foundations for the designation of international law as a separate legal system. Grotius was followed by such figures as Samuel von Pufendorf, Emer de Vattel and Christian Wolff.

In the 19th century the earlier doctrines of natural law, which viewed norms as predetermined by *nature of the Universe*, gave a way to doctrines of positive law, which viewed norms

as a product of negotiations between states. However, this shift did not undermine the overall deontological premise of legal studies. This approach (sometimes referred to as idealism) remained predominant in the broader field of international studies up until the 1930s.

By the end of this period, it coincided with a more modest functionalist approach, which sought to promote depoliticized regulation and establish transnational supervisory bodies in narrow technical areas. In the years preceding World War II both were challenged by self-proclaimed realists, who denied the ability of international law, much less international organizations, to impose meaningful constraints on states. By the time of the Cold War, thanks to the writings of Edward Hallett Carr, Hans Morgenthau and others, realism emerged as the dominant approach in international relations theory and retained its privileged position for decades.

However, starting from the 1950s, neofunctionalism sought to address realist scepticism while avoiding the previous fallacies of idealism and functionalism. It pointed that egoistic self-interest of states can incite them to promote international bodies, which despite the limited intentions of their founders would acquire increasing regulatory strength and reach. The works of such neofunctionalists as Ernst Haas paved the way for a broader research program of institutionalism (also known as liberal institutionalism). The latter flourished in the 1980s, with Robert Keohane and Stephen Krasner emerging as the most authoritative voices, introducing the actual term international regimes.

Soon after, the new wave of critical theory and later constructivism called for a complete revision of previous rationalist perspectives on regulations in international relations. Such authors as Friedrich Kratochwil, Martha Finnemore, Kathryne Sikkink and Thomas Risse pointed to the effects of persuasion and value change in establishing new standards of appropriateness. They demonstrated that intersubjective beliefs play a powerful role in guiding behaviour of not only individual humans, but also states.

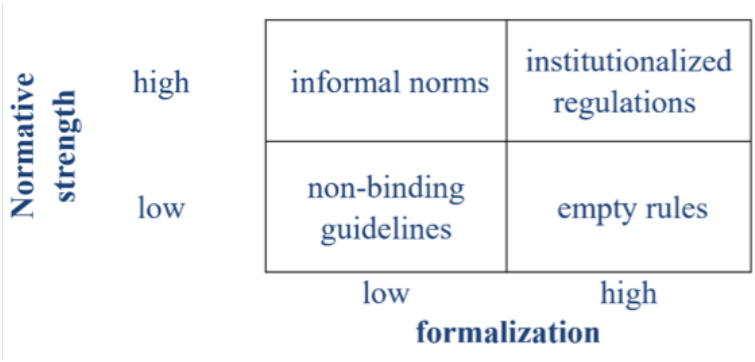
Evolution of theoretical approaches to understanding international regimes

- **Legalism and idealism:** deontological calls for the necessity of international norms and rules.
- **Realism:** skeptical criticism of legal / moral / institutional restrictions.
- **Functionalism and neofunctionalism:** technocratic appraisal of narrowly focused depoliticized regulation by experts.
- **Institutionalism:** emphasis on the feasibility of convergence of rational expectations among egoists.
- **Critical theory and constructivism**: emphasize the role of deep-seated shared beliefs in shaping behavior.

WHAT IS AN INTERNATIONAL REGIME?

The conventional definition of a norm was suggested by Martha Finnemore and Kathryne Sikkink. It defined a norm as “a standard of appropriate behaviour for actors with a given identity”[1]. Another scholar Peter Katzenstein defined norms as “collective expec-

[1] Find more: Finnemore M., Sikkink K. International Norm Dynamics and Political Change // International Organization. 1998. Vol. 52. № 4. Pp. 887-917.



tations about proper behaviour for a given identity"[2]. These definitions position norms as ideational social constructs, envisioning differentiation between what is considered a good or a bad action. They are broad enough to incorporate both legal and ethical norms as they do not presume formalization of the standard of behaviour, its codification in some treaty or agreement. Many of the norms guiding states in international politics are non-legal.

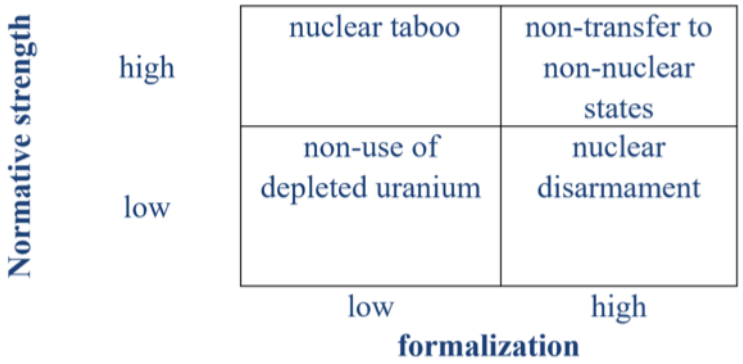
Moreover, there is no direct correlation between the level of formalization of a norm and its strength. One can even claim that the strongest norms do not require to be put on paper as they are self-enforcing. However, it is often important to put normative prescriptions on paper to ensure convergence of expectations and avoid arguments over their content. This need explains the advancement of international law throughout the last several centuries.

Therefore, international society is guided by a plethora of prescriptions varying in the degree of their normative strength and legality. Provisions, which entail strong collective expectations of proper or improper behaviour and at the same time appear prominently in international documents comprise the strongest type of regulations. A good example of such obligation is the prohibition on the transfer of nuclear weapons as well as associated technologies and material to the non-nuclear-weapon states. It is clearly stated in Article I of the Nuclear Nonproliferation Treaty (NPT).

> ***"Each nuclear-weapon State Party to the Treaty undertakes not to transfer to any recipient whatsoever nuclear weapons or other nuclear explosive devices or control over such weapons or explosive devices directly, or indirectly; and not in any way to assist, encourage, or induce any non-nuclear-weapon State to manufacture or otherwise acquire nuclear weapons or other nuclear explosive devices, or control over such weapons or explosive devices".***

Article I of the NPT
1968
Source: https://disarmament.unoda.org/wmd/nuclear/npt/text/

2 Find more: Katzenstein P. The Culture of National Security. Norms and Identity in World Politics. Columbia University Press. 1996. 560 p.



There are also regulatory provisions, incorporated in the legal documents, but possessing only weak normative persuasiveness. These are shallow rules, which have the form but not the content. The commitment to nuclear disarmament is of that nature. It is present in Article VI of the NPT, but remains purely specified, underestimated, and even ignored. It is this weakness which incentivized certain states and non-governmental organizations to seek its additional legal reinforcement beyond the NPT. Nevertheless, such efforts do not find approval from the nuclear-weapon states.

> ***"Each of the Parties to the Treaty undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control".***
>
> **Article VI of the NPT**
> **1968**
>
> *Source: https://disarmament.unoda.org/wmd/nuclear/npt/text/*

There are also informal norms, as was already mentioned, representing strong prescription of appropriate behaviour, which are not substantiated by any treaties. The prohibition on the first use of the nuclear weapon, commonly referred to as nuclear taboo, represents one example of such restrictions. China and India openly proclaimed as a matter of their national policies that they would use their nuclear arsenals only in response to nuclear attack. Other nuclear-weapon states did not join the same pledge, but in practice refrained from the use of nuclear weapons, even in instances when they faced defeats in regional conflicts and even in circumstances, when it made sense to use nuclear weapons for achieving military purposes. Therefore, the validity of nuclear taboo is often debated, but it has never been openly challenged on the battlefield.

Finally, there are certain regulations which possess neither normative strength, nor specific legal basis. At best, they remain feeble recommendations or guidelines that can abate, but not prevent certain types of actions. For example, the use of depleted uranium in ammunition and armour invited criticism and concerns regarding potential contamination and harmful consequences for the population in affected areas. However, such condemnation did not rise to the level where it can seriously undermine application of such substance. Moreover, there are no specialized documents directly prohibiting its use.

International norms either informal or legal rarely exist in solitude. They usually combine in broader regulatory complexes called international regimes. Convention definition of regimes was given by Stephen Krasner.

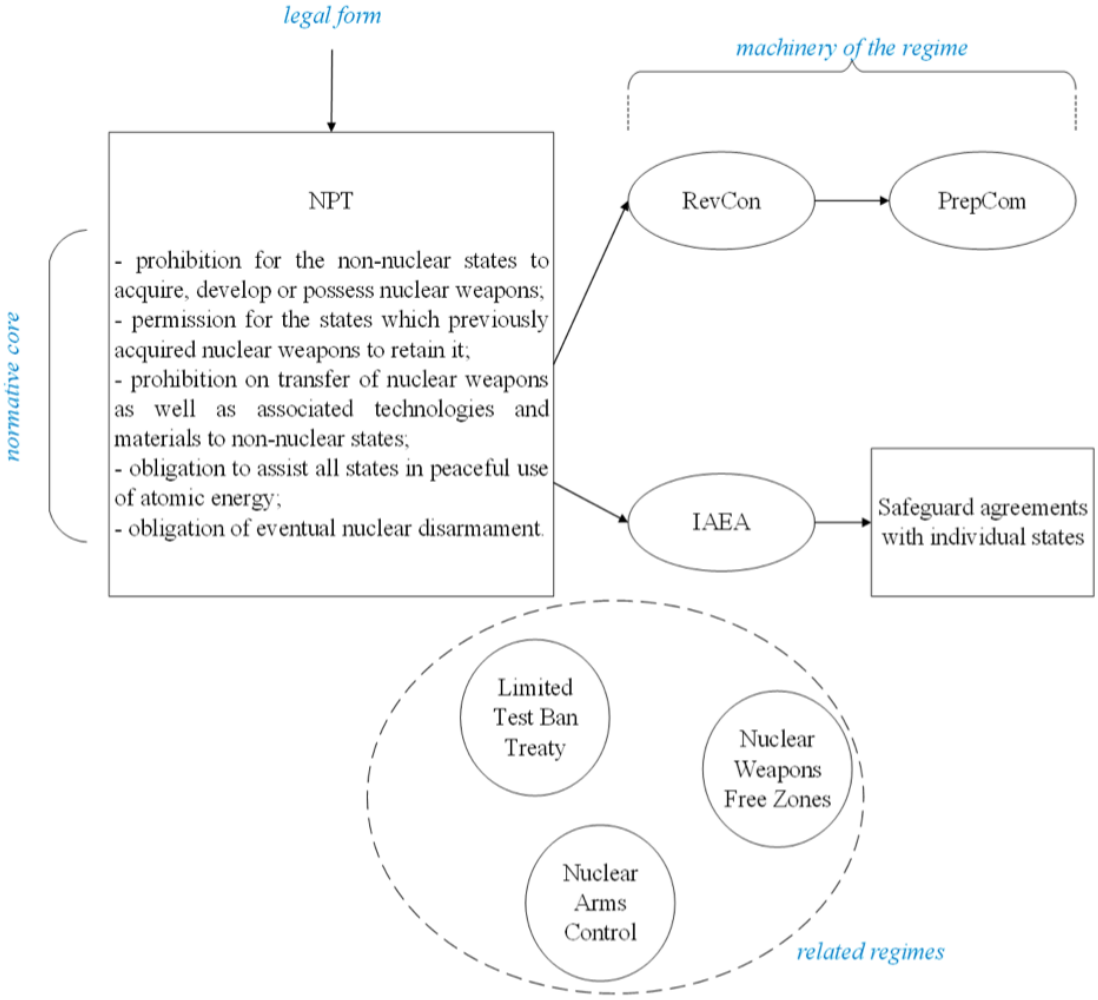
> **Regime** is a set of implicit or explicit principles, norms, rules and decision-making procedures around which actors' expectations converge in a given area of international relations.
>
> **Structural Causes and Regime Consequences: Regimes as Intervening Variables**
> **Stephen Krasner**
> **1982**
> *Source: https://www.jstor.org/stable/2706520*

This definition emphasizes that specific regulatory norms proceed from more general conceptual principles and received codification in institutionalized rules. However, in practice, as the subsequent discussion demonstrated, it is often difficult to distinguish between these three elements of a regime. What is more important in the definition is its emphasis that regulation in a specific issue area or domain cannot proceed from a single norm. Instead, international regime is tasked to provide a certain resolution or balance between mutually contradictory but equally important norms.

The nuclear nonproliferation regime is a great example of that. Its key elements are codified in a single document – Treaty on the Non-Proliferation of Nuclear Weapons. However, it contains not only the prohibition on acquisition of nuclear weapons by non-nuclear-weapon states, but several other norms. For instance, it also envisages permission of the peaceful use of nuclear energy by state parties. The NPT even requires nuclear-weapon states to provide assistance to ensure opportunities of such use. Given, the potential dual application of technologies simultaneous encouragement of peaceful atomic energy and restrictions on nuclear weapons under the singular treaty face significant trade-offs and controversies. Therefore, the success of the nonproliferation regime depends on the resolution of this contradiction.

No surprise, that most regimes rely not just on a single treaty, but on a set of documents and bodies, which codify not only initial norms, but their interpretations as well as rules of implementation, amendments, and guidelines. For example, the basic provisions of the NPT incentivized elaboration of safeguards agreements between state parties to the regime and International Atomic Energy Agency, which were later supplemented by Additional Protocol. The IAEA became a kind of implementing agency for the nonproliferation regime (even though it was established before the signing of the NPT in 1957). It provides expertise for conducting inspections and other verifying activities, which ensure compliance with the norms.

The resolution of arguments over the agreed norms and further adjustment of the regime requires the creation of a forum for regular meetings between parties. Its subsequent accords enrich the content of the regime. Again, the nonproliferation regime provides a great illustration of that. Article VIII of the NPT envisaged review conferences (RevCon) of the parties to take place every five years where states examine ways to advance the



aims of the regime[3]. Starting from the late 1990s they were supplemented by sessions of the Preparatory Committee (PrepCom) which enables continuity of work between review conferences. The PrepCom meets three times within each interconference period. There are also numerous other meetings and consultations, which are not part of the official review process, but also contribute to the strengthening of the nonproliferation regime.

> ***3. Five years after the entry into force of this Treaty, a conference of Parties to the Treaty shall be held in Geneva, Switzerland, in order to review the operation of this Treaty with a view to assuring that the purposes of the Preamble and the provisions of the Treaty are being realised. At intervals of five years thereafter, a majority of the Parties to the Treaty may obtain, by submitting a proposal to this effect to the Depositary Governments, the convening of further conferences with the same objective of reviewing the operation of the Treaty".***
>
> **Article VIII.3 of the NPT**
>
> **1968**
>
> *Source: https://disarmament.unoda.org/wmd/nuclear/npt/text/*

[3] Treaty on the Non-Proliferation of Nuclear Weapons, 1968 // United Nations Office for Disarmament Affairs.

Therefore, mature regimes entail not just a set of norms, but also a whole machinery of documents, bureaucracy, and fora in support of these norms. This machinery produces recurring practices, which are not necessarily written down in intestates documents. It is surrounded by a whole ecosystem of non-governmental activists and experts invested in observing, commenting, and advocating on the regime. It also promotes an opaque language shared by professionals involved in the operation of the regime. Such language is often heavily populated by technical terms and acronyms, such as IAEA safeguards, RevCon, PrepCom and so on. The process becomes as important for the success of the regime as the initial understanding of the parties if not more.

WHAT ARE INTERNATIONAL REGIMES GOOD FOR?

In terms suggested by an American economist Paul Samuelson, an international regime is a public good as opposed to various kinds of private goods or club goods[4]. It means that it is non-excludable in provision and non-rivalrous in consumption. Non-excludable means that even those actors, which do not participate in the regime, still enjoy benefits from it. For example, states which did not join NPT or withdrew from it, nevertheless, benefit from the constraints on proliferation of nuclear weapons that it envisages. This creates a freerider problem.

Characteristic	Rivalrous	Non-rivalrous
Excludable	Private goods	Club goods
Non-Excludable	Common resource goods	Public goods

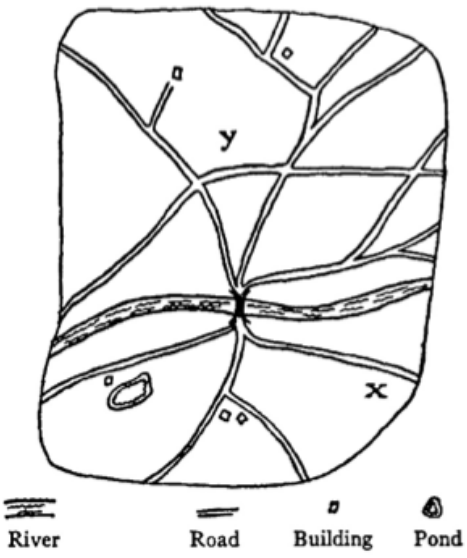
Non-rivalry means that the enjoyment of the regime by one actor does not diminish the ability of other actors to benefit from it. To the contrary, states often profit from the spread of the geographic coverage of the regime. Therefore, the fact that non-parties to the NPT benefit from the Treaty does not diminish the ability of parties to the NPT to acquire the same benefits. However, in case current non-parties would have joined the NPT, the amount of benefit of the regime to all its parties would increase. Of course, in such a scenario these *newcomers* would lose the current benefits that they acquire from their freeriding.

Now, the important question is how specifically states benefit from international regimes? There are several elements that define the answer to this question.

- *International regimes enables actors to locate a mutually beneficial equilibrium out of many other equally beneficial potential equilibria in their strategic interactions.*

In this sense it corresponds to the concept of a focal point introduced by Thomas Schelling[5]. One can imagine a situation in which a group of paratroopers deployed during the dark night in an unfamiliar terrain. As a result, they are dispersed across a wide area and lost to each other. However, to fulfil their mission they need their comrades. There-

[4] Find more: Samuelson P. The Pure Theory of Public Expenditure // The Review of Economics and Statistics. 1954. Vol. 36. № 4. Pp. 387-389.
[5] Find more: Schelling T. The Strategy of Conflict. Harvard University Press. 1981. 328 p.



fore, they will seek the salient object on a terrain, where they would anticipate other members of the group to expect to find them. It could be a high hill, a tall building, or a single bridge over a local river. The specific characteristics of this object are not important. What is important is that it stands out and therefore highly visible on the overall landscape.

Norms codified in a treaty or even in a prominent declaration establish highly visible benchmarks around which expectations of various states can converge. These benchmarks can be no better than some alternatives, but they are preferable, because other states will share the same expectations. However, this benefit can only be found in certain highly technical issues with relatively low stakes and no substantial differences in the interests of the parties. For example, it can explain why the interval between NPT review conferences is settled on five years and not four and a half years or 53 months. There would be no substantial difference between these three options, but five years represents an evident focal point, due to its simplicity as well as the human habit to round numbers.

- *A related although separate role of regimes is to lock expectations on a universally preferable equilibrium and avoid divergence to available inferior equilibria, therefore ensuring Pareto optimized outcome.*

This effect is often illustrated using the stag *hunt metaphor* introduced by Jean-Jacques Rousseau. One can imagine a group of hungry hunters in a forest aiming together to catch a stag. Stag is a major prize that would provide a lot of meat to each of the hunters, but it can be caught only through collective efforts if all hunters fulfil stick to their roles. We can assume that stag does not show up for some time and, in the meantime, a hare passes by one of the hunters. It creates an incentive for this hunter to divert from the designated role to catch a hare. A hare is a small prize, but a sure thing and one hunter can catch it alone. However, this diversion would create an empty space in the chain of the hunters and the stag would be able to escape leaving all other hunters with no prize and empty stomachs.

One should remember that individual hunters cannot control other members of the group. Therefore, while staying loyal to the team none of them can be sure that the rest would fulfil their duties. The risk of being left without any prize due to their betrayal increases the incentive of each of the hunters to go for a hare once it is possible. This creates a Pareto suboptimal equilibrium in which every hunter goes for a small prize and loses a change to acquire a big prize – a stag. If only all hunters could credibly commit that they would go for the stag no matter what, they would secure the big prize and achieve Pareto optimal equilibrium. Building upon this logic, international regimes provide a tool reaffirm the adherence of all states to an outcome superior for all. Often it enables to orient states from pursuing limited short-term benefits for a greater long-term gain, similarly to the metaphor regarding a hare and a stag.

FOOD FOR THOUGHT

For example, in a military domain all states can seek to advance their security by building stockpiles of certain weapons or by collectively committing not to build such weapons under an international treaty. In instances where capacities of the given states to build such weapons are comparable, in both scenarios they will acquire the same level of security (or insecurity). However, in the first scenario of an arms race they all incur major expenditures on building stockpiles. Therefore, such scenario represents a sub-optimal solution to an arms control regime restricting or fully prohibiting accumulation of these weapons. Unlike with the focal points, here the benefit of a regime lies not in pure reduction of uncertainty, but in increasing utility margin for each of the state.

One should note, however, that this logic does not require that all states have the same or proportional increase in utility from the regime. It can happen that certain states benefit more than others from the acquired equilibrium. What is important, is for every state to enjoy some raise in utility in the regime over the preceding base-rate and in comparison, with the unilaterally pursued alternatives. This can explain recognition by non-nuclear-weapon states of a limited number of nuclear-weapon states under the NPT. It was preferable to allow these five exceptions rather than face a much greater number of actors with nuclear weapons without a nonproliferation regime.

The previously described two benefits have to do with the regulatory core of the regime.

- *There are also additional gains emerging from associated machinery, which diminishes the risks of cheating by the parties.*

As it was mentioned earlier freeriding is an overwhelming problem for international regimes as states can reap the benefits from them even without bearing their burdens. However, such freeriding carries a threat of certain penalties in subsequent interactions. Thus, it is especially prevalent in instances of short-term or sporadic interaction among actors. However, international regimes usually create a framework for recurring dialogue within a certain forum such as the NPT review conferences.

Under these circumstances a single defection bringing immediate gains also produces recurring losses for the subsequent relations. This shadow of the future effect strongly disincentivizes cheating even if it cannot preclude it completely.

Even if the states interact repeatedly, cheating can remain prevalent as long as it stays unrevealed. Meanwhile, it is often hard to disclose activities that states pursue on their own territory. In international relations information is often scarce and unreliable. Mature regimes contribute to solving this issue by establishing a certain body or secretariat tasked to facilitate regular information exchange between parties and verification of their adherence to the established norms. This is the way it ensures that riding is actually not free. Transnational bureaucracies rarely have the capacity to sanction states, let alone incur meaningful harm as a penalty for their actions. However, just by reporting transgressions they make life of violators harder. With this information other states affected by cheating can either directly punish the freerider or impose a cost on it in future interactions.

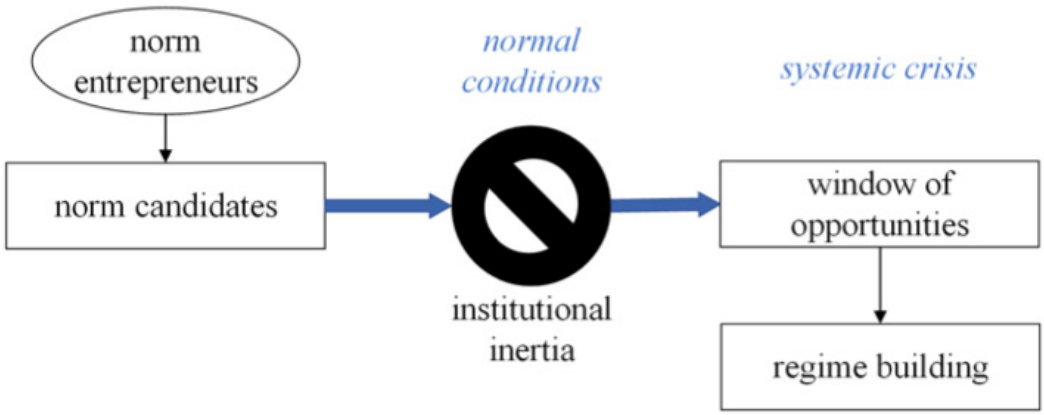
Illustratively, the nonproliferation regime relies on the expertise and resources of the International Atomic Energy Agency for conducting inspections and other activities aiming to examine potential violations of the NPT. The international status of the IAEA staff at least partially decreases concerns of national partisanship in conducting such inspections. The Organization itself has no operational instruments to discipline potential violations. However, its reports are used by the UN Security Council (UN SC) and its individual members to take punitive action against them. This monitoring function of the IAEA and other similar agencies contributes to the vitality of the regime.

FOOD FOR THOUGHT

For example, as part of the 1995 NPT and Extension Conference the parties committed to work towards the establishment of the Middle East Zone Free of Nuclear Weapons and Other Weapons of Mass Destruction (MENWFZ). This pledge became a major condition which persuaded several non-nuclear-weapon states to accept prolongation of the Treaty indefinitely. However, during the subsequent meetings the discussions on the MENWFZ did not go anywhere. This absence of progress on a crucial part of the preceding deal created resentment among the parties that felt strongly about it and complicated negotiations at the following NPT review conferences. They felt double-crossed and betrayed. For instance, the 2000 NPT Review Conference failed to produce a joint document partly due to the unfulfilled promise on the Middle East. Overall, the absence of the MENWFZ substantially complicates further deals to advance the regime.

WHERE DO REGIMES COME FROM?

Introduction of new norms and establishment of an international regime requires substantial investment as it creates a lasting change for the *status quo ante*. Under ordinary circumstances the initial conditions preceding the initiation of new norms rely on a significant constituency of satisfied actors. Even those who experience certain harm prefer to stick with the *devil they know*. The inertia of the present is a strong barrier on the pathway to a future regime. Therefore, despite all the potential benefits of such a regime, the emergence of new regulations in international relations is neither easy nor frequent event. It often faces significant resistance and blowbacks.



The initial impetus for the arrival to new norms often comes from a major preceding crisis. This singular event reveals the risks and downsides of the preceding state of affairs,

which earlier was thought to be satisfactory. In other words, international crises despite their dangers create windows of opportunity focusing attention of various states and their publics on an unresolved problem. Such windows usually close relatively quickly as the focus of attention switches to some other areas. If there were no precooked solutions, the crisis would be simply waisted for the regime-building.

Therefore, suggestions regarding potential norms usually circulate among the professionals in the area even before the crisis. Policy activists and experts which are often referred to as transnational advocacy networks and epistemic communities become instrumental in developing and lobbying ideas, aspiring to acquire normative status. They are more likely than state officials and leaders to promote innovative suggestions.

Similarly, small states often have the capacity and concentrated interest to advocate a particular norm in comparison to major powers with diversified foreign policy portfolio. These actors (often defined as policy entrepreneurs) employ a wide range of rhetorical and policy strategies to advance their deep-seated beliefs.

One example of such strategies is grafting, when a new norm in a certain issue area is presented as an analogy or an extension of already well-recognized norms in other issue areas. This kind of rhetorical manipulation creates a sense of familiarity and legitimacy for novel ideas. The arsenal of norm entrepreneur also includes information sharing, rational persuasion, and emotional appeals, often in the form of *shaming and blaming*. However, potential norms advocated in such ways lack sufficient salience to receive wide support under the normal conditions. They need to wait for an exogenous shock to focus attention on the problem and exacerbate its magnitude.

The most evident instance of a crisis in a nuclear field was Cuban Missile Crisis in 1962. It demonstrated to the Soviet Union and the United States as well as the rest of the world the dangers of unrestrained confrontation between the superpowers. As a result, it created an impetus for the adoption of a Limited Nuclear Test Ban Treaty (LTBT) and later Nonproliferation Treaty and limitations on strategic nuclear arms. The ideas behind these regimes emerged earlier, but states did not feel enough urgency to build upon them.

Cartoon portraying the leaders of the USSR and the US Nikita Khrushchev (*on the left*) and John Kennedy (*on the right*)

Source: https://gazeta.mgimo.ru/articles/Caribbean_crisis

Nevertheless, a good crisis and preexisting ideas are not good enough for the introduction of a regime. In international relations, when faced by a problem, states seek unilateral means to solve it. Cooperation with others requires painful compromises and concessions, so it is much preferable to secure one's interests by

oneself. In the nuclear domain this instinct encourages the search for nuclear superiority and strategic invulnerability. Therefore, the prospects of establishing international regimes increases under two quite different scenarios.

▶ *First scenario of establishing international regimes*

It becomes plausible under conditions of a stable parity of capabilities and threats when no single state can expect to achieve superiority and impose its preferences on the others. In these circumstances parties retain no other option to secure their interests apart from cooperating with each other on the creation of a regime. Therefore, international regime emerges as a preferable option not only to the disappointing *status quo*, but also to the *best alternative to negotiated agreement* (BATNA).

> **FOOD FOR THOUGHT**
>
> *The state of Soviet-American nuclear arms race reached this point by the late 1960s. Before that the US preserved nuclear superiority that they hoped to reinforce and did not want to grant major concessions to Moscow. On the other hand, the Soviet Union strived to catch up with Washington and, therefore, did not want to accept any normative limitations which could stand on its way. Only when the two sides realized inability to achieve unilateral advantage, they settled for an arms control. This example illustrates that major shifts in the balance of power are disadvantageous for regime-building.*

However, each state should preserve some concern regarding potential weakening of its position in future to accept explicit common regulations. If parity appears completely unalterable then the new norm does not require institutionalization with the whole machinery of a mature regime as it becomes self-enforcing. Under such conditions deviations from the single clearly recognizable equilibrium are so harmful that remain unimaginable. For example, in a family the disparity in power, status and roles of parents and babies are so enormous that they do not require bargaining. As the kids grow this situation certainly changes. In international relations the position of superstability is virtually unreachable.

▶ *Second scenario of establishing international regimes*

The second scenario under which regime building becomes possible is completely the opposite. It is when one state or a group of states become so powerful that they can impose their preferred norms without major concessions to others. Again, in this case it is helpful when this predominant state or a group of states have some concern that their predominant position can deteriorate in future. Then, the price of regime-building remains manageable, and it serves as an insurance against potential risks. In such hegemonic regimes the predominant actor uses a combination of coercion and inducement to make other states to accept the preferable norms. It can put pressure on the dissenters. It has also reasons to cover most costs associated with the regime-building and provide side payments for its followers.

One should note that weaker states have their own reasons to accept hegemonic regimes, as they acquire greater predictability with the introduction of specific norms. Given their material superiority, these actors are constantly afraid of becoming a victim of

voluntarism exemplified by major powers. International regimes, even if they reflect the interests of hegemonic players, are preferable to the complete arbitrariness of the strong. Moreover, negotiation fora established under such regimes provide weaker states with a platform to voice their grievances to the major powers and therefore increase chances to affect decision-making of the latter. These voice opportunities remain valuable as often weaker states face hard times in attracting the attention of stronger actors.

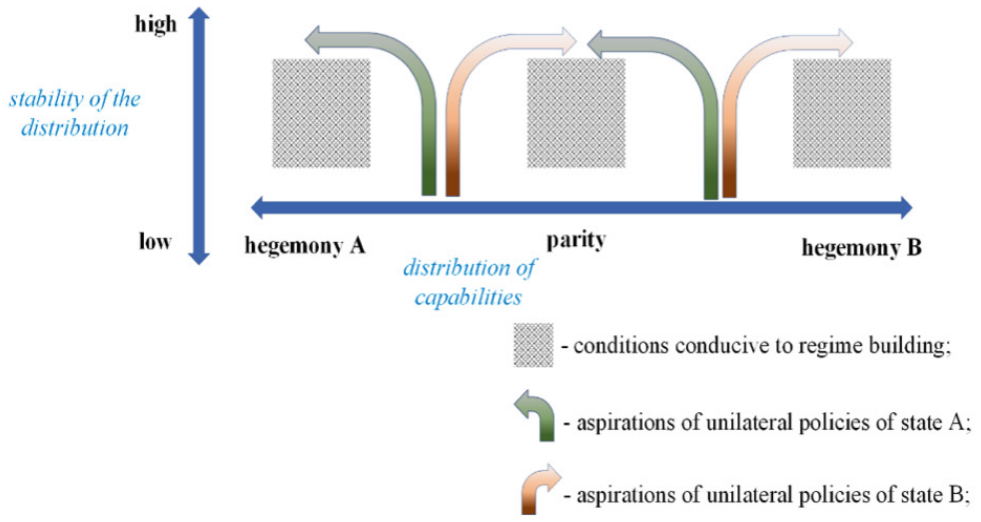
FOOD FOR THOUGHT

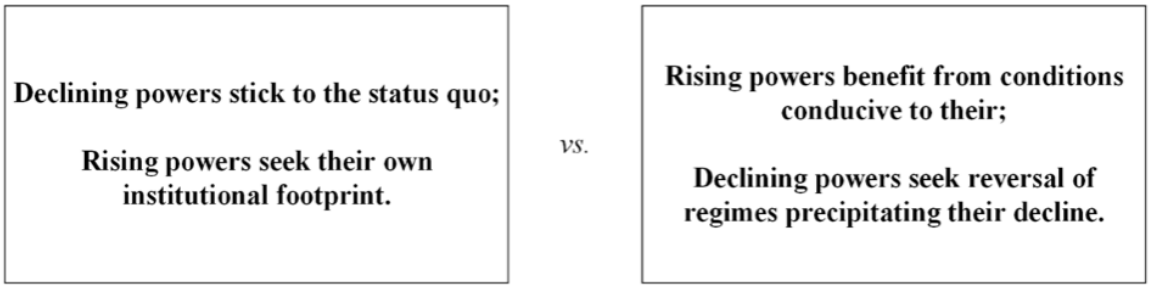
The Soviet Union and the US initially played a major role in promoting the NPT. The two superpowers, due to their military and economic predominance in the world, sought to limit the number of nuclear powers (as the nuclear weapons could make states less amenable to their wishes – one can remember in this regard the recalcitrant stances of France or China). The Soviet Union and the US were eager to buy the support of other states in promoting the nonproliferation regime, for example, by assisting them in the development of their peaceful atomic programs.

No wonder that many non-nuclear-weapon states eagerly accepted the NPT. Although, they were not necessarily happy about exceptional privileges of the nuclear-weapon states, many of them benefited from the constraint which prevented acquiring of nuclear weapons by a broader range of actors including their immediate neighbours and rivals. Overall, smaller states prefer to operate in an institutionalized environment, despite the fact that major powers sometimes violate international norms with relative impunity.

DO MATURE REGIMES DECAY?

The important contribution of a distribution of power (either stable parity or hegemony) to the prospects of the regime-building creates a presumption that major shifts in capabilities would lead to the demise of previously established regulations. Many scholars and analysts, largely from the realist camp share this concern. They point for example to the fate of the Washington Treaty of 1922 and naval arms control in the interwar period. Restrictions which were imposed on the size of the fleets after World War I crumbled in the 1930s with the changes in relative power between the *status quo* and revisionist powers.





Even realists differ in assigning the blame for regime decay. Some of them argue that rising powers, which did not have a chance to play a major role at the inception of a regime, would be eager to replace it by an alternative regulation of their own liking. Meanwhile, the previously dominant powers under this logic hold onto the norms that they managed to secure in their heyday when they were in better position to decree their preferences. Others, to the contrary, claim the previously dominant powers are the ones to undermine existing regimes as these regimes precipitated their decline. Meanwhile, the rising powers profited from the regimes that enabled their rise and therefore would not be interested in their dismantlement.

However, there are two main sets of counterarguments against the very association of power shifts and regime decay. They explain the reasons: why mature regimes can survive redistribution of material capabilities in the international system.

▶ *Institutional inertia*

As it was mentioned earlier, regimes lock expectations of parties around a salient equilibrium of preferences. Individual deviations from this equilibrium would face disapproval from other states, which are comfortable with the existing arrangements. The power of social inertia which resisted regime-building in its early stages, now supports its reinforcement. The machinery of the regime, including legal instruments, common fora, monitoring bodies filled with transnational bureaucracy all counteract individual deviations and overall decay of the core norms defining the regime.

Transnational bodies emerge as the most active lobbyists of the regime, as their very existence depends on its survival. They can even except certain modifications in this regime in order to protect and revitalize its core norms. As a result, long-living organizations are sometimes metaphorically described as *garbage bins* being preexisting solutions searching for the appropriate problems to solve. These are all rationalist arguments regarding the endurance of the regimes.

▶ *Internalization*

With time states internalize standards of appropriateness associated with the regime. As a result, their adherence to norms becomes more dependent on habits, recurring routines and adjusted moral beliefs. They start to follow them, because it is proper, good and familiar, not because their non-observance will lead to punishment. In certain instances, internalization can become so deep that violation of a norm appears completely unthinkable. Internalization leads to the transition from the compliance base on the fear of consequences to the logic of appropriateness. It fosters not only compliant behaviour, but also transformation of preferences of an actor. This is a social constructivist argument in favor of the endurance of the regime.

FOOD FOR THOUGHT

Combinedly the rationalist and social constructivist arguments explain why the NPT did not disappear after the end of the Cold War, the collapse of the Soviet Union and major redistribution of power in the international system. To the contrary, in 1995 the NPT was prolonged indefinitely. The commitment to NPT became embedded in the policies of many states, while proliferation of nuclear weapons has been already perceived as the morally repugnant thing. Illustratively, certain states that previously considered purchasing nuclear deterrence, such as Brazil or Sweden, gave up on such idea.

▶ *Strengthening of a regime through contestation*

However, these mechanisms which anchor mature regimes are rarely strong enough to eliminate any challenge to the existing norms. Instead, recent studies emphasize the prevalence of normative contestation in international relations. Even relatively mature and internalized norms face regular criticism from various angles. For example, the central premises of the nonproliferation regime face challenges from at least two opposite sides.

On the one hand, a number of states created nuclear weapons outside of its framework, therefore challenging the NPT prohibition on developing such arms by states which did not possess it by January 1, 1967. They contest the norm against proliferation, questioning its justice. On the other hand, a group of other states and activists call for the complete prohibition of nuclear weapons and even elaborated a separate treaty pursuing this aim. These actors contest the continuous possession of nuclear weapons by the nuclear states, questioning its safety. Activities of both these groups can lead to the weakening of the nonproliferation regime, even despite their intentions.

However, contestation does not necessarily undermine the existing regimes. Counterintuitively, historical record demonstrates that contestation contributes to the strength of a regime in three distinct ways. First, it reminds various actors about the very existence of a norm by drawing attention to it. Therefore, contestation helps to keep the vitality of this ideational construct and prevents it from becoming obsolete. Second, contestation demonstrates the ambiguities associated with the norm and helps to clarify them. As a result, it makes norms more applicable and specific. It strengthens the regime. Finally, contestation enables states which did not participate in the initial formulation of the norm to contribute to its interpretation, transforming them into its co-sponsors. Therefore, contestation widens the coalition in support of the norm.

Nevertheless, contestation can lead to the weakening and demise of a norm and therefore of the whole regime. The record of the early 21st century is illustrative in this regard, as several previously prominent regimes, including those codified in Anti-Ballistic Missile Treaty (ABM Treaty) or Intermediate-Range Nuclear Forces Treaty (INF Treaty) vanished. Primarily, the difference between productive and destructive contestation lies in its object. Productive contestation, enabling to strengthen and advance the regime, primarily revolves around differences in application of a norm.

Meanwhile, contestation that challenges the core norms of the regime, can lead to its dissolution. As a result, even mature regimes remain fragile and despite all institutional in-

ertia and internalization sometimes decay. Henceforth, it is important to study how various mechanisms and forces outlined by the regime theory interact in a specific issue area, such as nonproliferation or arms control.

WHAT DOES MAKE ARMS CONTROL SPECIAL?

The broadly understood arms control, also covering nonproliferation and disarmament, comprises a wide array of international regimes with a long history. Some early examples can be traced back to the Second Lateran Council of the Catholic Church in 1139, which prohibited the use of bows and slings against Christians. Another prominent historical instance was the declaration prohibiting the use of explosive bullets adopted in Saint Petersburg in 1868. The main defining characteristic of this category of regimes despite many differences between various examples is their primary focus on restricting or complete elimination of certain means of violence.

> **FOOD FOR THOUGHT**
>
> *Any attempts to introduce regulation in the field of international security attract doubts. Critics claim that in search to ensure their own survival states will not accept any restrictions or limitations on their freedom of action. In this regard, security domain is different from global economy or environmental protection or human rights issue areas. This scepticism assumes that once the intensity of rivalry reaches a certain level the prospects of arms control diminish. Nevertheless, historical record demonstrates that even at height of most intransigent wars states followed certain limitations and accepted some boundaries in their actions. Interstate rivalries are highly ritualized competitions rather than street fight. For example, throughout World War II, which was the bloodiest conflict in the history, chemical weapons which was actively developed previously was used only a few times and the scale of chemical warfare appeared much more limited even in comparison with World War I.*

Unlike some other regimes, arms control does not deal with the ends of policy (such as norms promoting human rights or environmental protection) or certain modes of interaction (such as norms prohibiting wars or regulating trade) or certain ways of conducting warfare (like humanitarian law). In a nutshell, it focuses on certain kinds of weapons, as well as associated materials, crafts and technologies. And due to the nature of their object, such regulations face several normative and practical challenges which separate them from other types of regimes.

▶ *Moral confusion over selective restrictions*

First, the selective coverage of arms control, nonproliferation, and disarmament regimes triggers controversies over why this and not that weapons should be prohibited or at least restricted. The main justification usually concentrates on a particular danger, offensive character or indiscriminate harm incurred by designated means of violence. The introduction of the category of weapons of mass destruction (WMDs) with the emphasis on the amount of suffering that it brings about is illustrative in this regard.

However, such explanation also produces criticism from those who claim that by reducing the pains of a potential military conflict these norms make its prospect less frightening and in certain instances even strategically appealing. This argument constitutes the core of the

theory of *nuclear peace*, which explains the lack of major wars since the middle of the 20th century by the terrifying destructiveness of modern weapons. Nevertheless, arms control specialists claim that rationalistic proponents of *nuclear peace* underestimate the dangers of miscalculations, misinterpretations and accidents which could lead to the undesirable escalation. Moreover, they point to the other restraints on military confrontation among states including economic interdependence and growing value of human lives.

▶ *Uncertainty produced by technological change*

Second important challenge to arms control arises from technological developments, which contribute to the deployment of novel means of warfare. Meanwhile, regimes often remain technology specific. Henceforth, emerging weapons threaten to make certain regimes obsolete due to the diminishing military significance of the restricted types of weapons and/or inapplicability of previously accepted norms to the new, more dangerous categories of arms. For example, during the interwar period restrictions on the number and size of battleships became less relevant with the advancement of air careers. Moreover, technological developments make certain capabilities previously available only to a limited number of major powers increasingly available to the growing population of actors, including non-state actors.

Finally, technological change exacerbates the perception of novelty and uniqueness of the emerging weapons, which undermines some of the tactics commonly used by policy entrepreneurs to advance norms. Specifically, they can make grafting, which relies on the presentation of a new norm as familiar to the ones that exist in other issue areas, less convincing. For example, there were some attempts to criticize the potential military use of artificial intelligence by drawing comparison of its potential revolutionary effect with the revolutionary changes produced nuclear arms and other WMDs. However, such efforts faced pushback given the fact that AI does not presume changes in the destructiveness of weapons, rather it can affect the speed and quality of decision making on the battlefield.

In response to the challenges posed by technological change certain experts advertised the advantages of preventive arms control, which would establish norms prohibiting or restricting weapons before they are developed. Nevertheless, such calls face an uphill battle as states are rarely interested in limiting potentially promising capabilities before they become certain that they cannot achieve superiority in their development. Moreover, it is hard to design a proper regulation for an object which specific characteristics remain relatively unknown and untested.

Overall, concerns over the detrimental consequences of technological change for international norms are real but can be somewhat mitigated. The machinery of international regimes, including fora for interstate dialogue and supplementary documents adopted by parties can help patch emerging loopholes in the regime. More than that, the hype surrounding the novel weapons often obscures that genuine revolutions in military technologies are relatively rare and there is a lot of continuity and parallels between the newly developed means and previously existing.

CONCLUSION

The record of arms control and nonproliferation regimes, although imperfect and full of retreats, is not hopeless. Some norms and institutions served for years and decades contributing to international stability and security.

UNIT I.

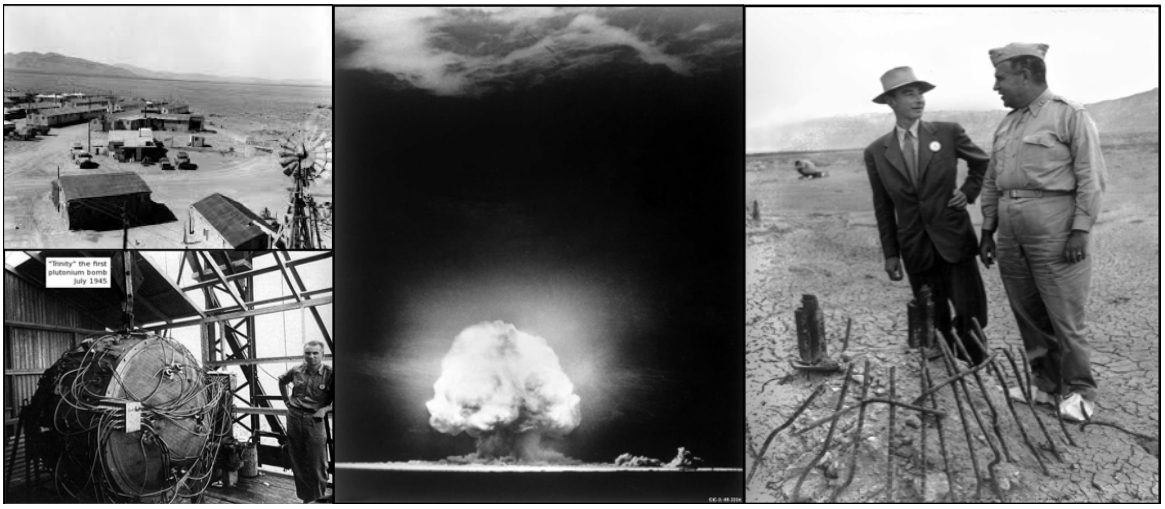
THE NUCLEAR NONPROLIFERATION REGIME: THE LONG ROAD TO BE ESTABLISHED

PAPER 2.

HISTORICAL ASPECTS OF DEVELOPING THE NUCLEAR NONPROLIFERATION REGIME: BEFORE THE NPT

Elena Karnaukhova

On July 16, 1945, the nuclear age began. On this day the USA conducted the world's first nuclear test at a site located in the Alamogordo dessert in New Mexico. Its code name was Trinity. Just over 20 years passed before the international community could produce a fundamental document to prevent the spread of nuclear weapons, namely the Treaty on Non-Proliferation of Nuclear Weapons (NPT). But the very idea to limit the quantity of states possessing a nuclear bomb first appeared even before the Trinity atomic explosion occurred in New Mexico.



The world's first nuclear test. Trinity Test Site, Alamogordo Desert, New Mexico, USA. July 16, 1945
Source: open data

FIRST ATTEMPTS TO ESTABLISH CONTROL OVER NUCLEAR ENERGY

In Summer 1942, during World War II (1939-1945), Sir John Andersen wrote a letter to the head of the US Office of Scientific Research and Development Vannevar Bush where he raised a question on international control over nuclear energy and proposed to establish an atomic energy commission with the representatives of Great Britain and the US in order to decide which countries to involve in this system of control over nuclear energy. At that time the US was rather indifferent to British initiatives. If the main idea of John An-

dersen was to accelerate the acquisition of nuclear status by Great Britain with the help of an American ally, then the US wanted to preserve *status-quo* and guarantee their nuclear monopoly.

In April 1945, the US Secretary of War Henry Stimson prepared a memorandum for new American President Henry Truman (1945-1953). In the document he asserted the following:

> ***Within four months we shall in all probability have completed the most terrible weapon ever known in human history...***
> ***...no other nation could reach this position for some years. Nevertheless, it is practically certain that the US could not remain in this position indefinitely.***
> ***...the future may see a time when such a weapon may be constructed in secret and used suddenly and effectively with devastating power by a willful nation... although probably the only nation which could enter into production within the next few years is Russia.***
> ***...the question of sharing the weapons with other nations and, if so shared, upon what terms becomes a primary question of our foreign relations".***
>
> **Memorandum discussed with the President**
> **April 25, 1945**
> *Source: https://nsarchive.gwu.edu/document/28505-document-6b-memorandum-discussed-president-april-25-1945*

After long discussions in inner circles, the US set a course for establishing international control over nuclear energy. Together with Great Britain and Canada they accepted in 1945 a declaration to propose to create an international commission to control nuclear energy under the auspices of the United Nations (UN). On January 24, 1946, the United Nations Atomic Energy Commission (UNAEC) was founded by the very first resolution of the United Nations General Assembly (UN GA) "to deal with the problems raised by the discovery of atomic energy"[6].

It included permanent members of the UN Security Council (UN SC) and Canada. Based on the resolution, the UNAEC shall make specific proposals:

- for extending between all nation the exchange of basic scientific information for peaceful ends;
- for control of atomic energy to the extent necessary to ensure its use only for peaceful purposes;
- for the elimination from national armaments of atomic weapons and of all other major weapons adaptable to mass destruction;
- for effective safeguards by a way of inspection and other means to protect complying states against the hazards of violations and evasions[7].

The same month the US Secretary of State James Byrnes created a special advisory committee to prepare American proposals for the UNAEC. In March 1946, it present-

[6] Resolutions adopted by the General Assembly during its 1st session A/RES/1(I), January 24, 1946 // UN General Assembly Resolutions Tables.
[7] Ibid.

ed its report known as the Acheson-Lilienthal report named after Under-Secretary of State Dean Acheson and the Chairman of the Tennessee Valley Authority David Lilienthal. The main idea of the plan was to create Atomic Development Authority to own all the fissile materials, to control the mining of uranium and thorium and their use, to oversee all the nuclear facilities able to produce nuclear weapons and to conduct inspections. Moreover, the Authority should provide any interested countries with the licenses to develop peaceful nuclear research.

Establishment of a Commission to deal with the problems raised by the discovery of atomic energy

> ***"Resolved by the General Assembly of the United Nations to establish a Commission, with the composition and competence set out hereunder, to deal with the problems raised by the discovery of atomic energy and the other related matters...".***

Resolutions adopted
by the General Assembly during its 1st session
A/RES/1(I)
January 24, 1946
Source: https://research.un.org/en/docs/ga/quick/regular/1

President Truman generally accepted the report but decided that the US would be represented in the UNAEC by Bernard Baruch, famous American financier and statesman, who modified the report. The Baruch Plan proposed to create one such Authority which could control the development and the use of atomic energy, would introduce the practice of international on-site inspections, and at the same time it would exclude the use of the veto by the UN SC permanent members and would allow the introduction of coercive measures such as sanctions against violators of international law, bypassing the UN Security Council.

It should be noted that the Baruch Plan reflected the general US policy of the USSR containment. When Bernard Baruch presented his ideas to the UNAEC the Soviet Union declined the plan because it put limits on its own nuclear program and was designed to guarantee the nuclear monopoly of the US. In return, the USSR proposed its own initiative in particular, a draft convention for immediate prohibition of all manufacture and use of atomic weapons. The plan was named after the Soviet diplomat Andrei Gromyko.

> ***Gromyko Plan assumed primarily the following:***
> - ***not to use atomic weapons in any circumstances whatsoever;***
> - ***to prohibit the production and storing of weapons based on the use of atomic energy;***
> - ***to destroy, within a period of three months from the day of the entry into force of the present convention, all stocks of atomic energy weapons whether in a finished or unfinished condition.***

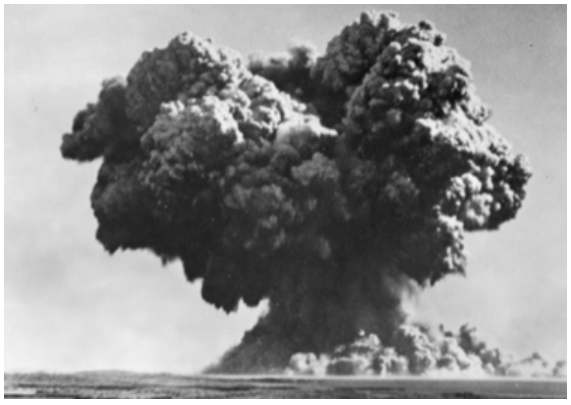
Based on the Address by the Soviet Representative Andrei Gromyko
to the United Nations Atomic Energy Commission
(Gromyko Plan)
June 19, 1946
Source: https://fissilematerials.org/library/un46.pdf

Gromyko Plan was declined by the members of the UNAEC as well.

> *Peoples remember well that… the Soviet Union was the first to raise its voice against nuclear weapons, demanding their ban. Even then, the USSR declared that the use of atomic energy for military purposes was incompatible with the conscience of mankind. It came up with a proposal to conclude an international convention prohibiting forever the military use of atomic energy, switching it only to peaceful purposes…A lot of papers were written at that time, statesmen and diplomats delivered many speeches. But when discussing the issue, the efforts of some countries were aimed at preserving nuclear weapons and the US monopoly, while others aimed at banning these weapons at all".*
>
> **Andrei Gromyko**
> **1990**
>
> **(Unofficial translation)**
>
> *Source:http://publ.lib.ru/ARCHIVES/G/GROMYKO_Andrey_Andreevich/_Gromyko_A.A..html*

Soon the American nuclear monopoly ended. On August 29, 1949, the USSR tested its atomic bomb in the Semipalatinsk site. On October 3, 1952, Great Britain became the third nuclear power in the world after testing its first plutonium implosion device in the Montebello Islands in Western Australia. In 1952, the UNAEC was formally abolished. Thus, the first attempts to establish control over nuclear energy as a pre-image of the nuclear nonproliferation regime were unsuccessful and failed.

The first nuclear test of the USSR. Semipalatinsk test site at Kazakhstan. USSR. August 29, 1949
Source: open data



The first nuclear test of Great Britain. Montebello Islands. Western Australia. October 3, 1952
Source: open data

FROM ATOMS FOR PEACE SPEECH TO THE IAEA

The 1950s were a period of rapid spread of nuclear technologies. Many countries became interested in peaceful use of atomic energy. For them nuclear energy was a kind of instrument to promote industrial development, to facilitate economic growth and, of course, to create a technological base for their military programs. Great Britain, the US, and the Soviet Union began to build research, experimental ad power nuclear reactors. As the Chairman of the Soviet Council of Ministers Nikolay Bulganin stated in 1956, the USSR was going ahead of the rest of the world in the use of nuclear energy for peaceful purposes. In 1953, the Soviet government decided to build a nuclear ice-breaker – the first in the world.

Nuclear power plant in Obninsk (first in the world). USSR, 1954
Source: open data

Nuclear ice-breaker Lenin (first in the world). USSR, 1957
Source: open data

In 1954 the USSR launched nuclear power plant in Obninsk – again the first in the world. At the same time the Soviets were negotiating agreements on cooperation in peaceful uses of nuclear energy with China, Hungary, Egypt and with many other countries.

The US wanted to get a leadership position in this sphere as well. In 1953, American President Dwight Eisenhower (1953-1961) delivered his famous speech *Atoms for Peace* in his address to the 470th Plenary Meeting of the UN GA. In his speech he returned to the idea of establishing international control over nuclear energy.

> ***...We shall carry into these private or diplomatic talks a new conception. The United States would seek more than the mere reduction or elimination of atomic materials for military purposes. It is not enough to take this weapon out of the hands of the soldiers. It must be put into the hands of those who will know how to strip its military casing and adapt it to the arts of peace...".***
>
> **Address by Mr. Dwight D. Eisenhower,**
> **President of the United States of America, to the 470th Plenary Meeting**
> **of the United Nations General Assembly**
> **December 8, 1953**
> ***Atoms for Peace* speech**
> *Source: https://www.iaea.org/about/history/atoms-for-peace-speech*

In his speech President Eisenhower proposed to establish an international agency responsible for the impounding, storage and protection of the contributed fissionable and other materials. The more important responsibility of this atomic energy agency would be to devise methods whereby this fissionable material would be allocated to serve the peaceful pursuits of mankind. Experts would be mobilized to apply atomic energy to the needs of agriculture, medicine and other peaceful activities.

Many analysts considered the *Atoms for Peace* speech as rather controversial. Firstly, initiatives of Eisenhower were designed to help American companies to get position

of leadership or even monopoly within the international nuclear technologies market. Secondly, the speech should influence relations between the US and its allies, the US and developing countries in the context of bipolar competition with the USSR. Thirdly, it was also seen as a kind of attempt to boost a dialogue with the USSR on disarmament issues. Contribution of fissile materials to the agency would be rather symbolic. At the same time the US was massively developing its military-industrial complex. Besides, the *Atoms for Peace* speech was aimed at promoting American military dominance in the world as well.

As the Soviet and Russian Ambassador Roland Timerbaev, one of the *founding father* of the NPT, wrote, despite being controversial the *Atoms for Peace* speech was a step forward in developing measures to put limits on nuclear proliferation. It was much more acceptable for the USSR than the Baruch Plan. The Soviet Union reacted to the initiatives of President Eisenhower rather constructively. In December 1953, Soviet government made a statement with the following theses:

1. President Eisenhower highlighted the destructive power of atomic weapons... Over time, the significance of this problem is increasing even more.
2. The USSR, for its part, invariably strives to help reduce tensions in international relations and ensure the strengthening of peace throughout the world.
3. The Soviet government is ready to take part in such negotiations... and proceeds from the fact that the Soviet proposal will be considered so that states, guided by the desire to reduce international tension, accept an unconditional commitment not to use atomic, hydrogen or other weapons of mass destruction.
4. The position of the USSR is completely clear. It wants to turn this great discovery of the human mind not against civilization, but towards the comprehensive progress of humanity, peaceful needs, and improving the well-being of the population[8].

In 1954, the Soviet-American and then multilateral international negotiations started which resulted in establishing International Atomic Energy Agency (IAEA) in 1957. In July of that year the Statute of the IAEA came into force.

Furthermore, the IAEA was authorized to establish and administer safeguards designed to ensure that special fissionable and other materials, services, equipment, and facilities are not used to further any military purpose. Above all, to apply safeguards, the Agency was empowered to designate and to send inspectors to the territory of the recipient state. Those inspectors shall have an access at all times to all places and data and to any person, who by reason of occupation, deals with materials, equipment, or facilities that are required to be safeguarded. And in case of non-compliance the Agency was authorized to take requested corrective steps.

Establishment of the IAEA met the trends of the time. In 1950-1960s, so many countries were developing nuclear programs. As some Russian experts say it was the period of romantic interest in the atom[9]. Some of them were provided with the foundations for nuclear programs thanks to the assistance of the US or the USSR, which exported highly enriched uranium, supplied equipment, helped to build nuclear reactors and so on.

---

[8] Find more: Тимербаев Р.М. Россия и ядерное нераспространение. 1945-1968. – М.: Наука, 1999. С. 86.
[9] Find more: Ядерное нераспространение: Учебное пособие для студентов высших учебных заведений. В 2-х томах. Том II / Под общ.ред. В.А. Орлова. 2-е изд., переработанное и расширенное. – М.: ПИР-Центр, 2002. – 560 с.

“ARTICLE II: Objectives
The Agency shall seek to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world. It shall ensure, so far as it is able, that assistance provided by it or at its request or under its supervision or control is not used in such a way as to further any military purpose.

ARTICLE III: Functions

1. To encourage and assist research on, and development and practical application of, atomic energy for peaceful uses throughout the world; and, if requested to do so, to act as an intermediary for the purposes of securing the performance of services or the supplying of materials, equipment, or facilities by one member of the Agency for another; and to perform any operation or service useful in research on, or development or practical application of, atomic energy for peaceful purposes;
2. To make provision, in accordance with this Statute, for materials, services, equipment, and facilities to meet the needs of research on, and development and practical application of, atomic energy for peaceful purposes, including the production of electric power, with due consideration for the needs of the under-developed areas of the world;
3. To foster the exchange of scientific and technical information on peaceful uses of atomic energy;
4. To encourage the exchange and training of scientists and experts in the field of peaceful uses of atomic energy;
5. To establish and administer safeguards designed to ensure that special fissionable and other materials, services, equipment, facilities, and information made available by the Agency or at its request or under its supervision or control are not used in such a way as to further any military purpose; and to apply safeguards, at the request of the parties, to any bilateral or multilateral arrangement, or at the request of a State, to any of that State’s activities in the field of atomic energy;
6. To establish or adopt, in consultation and, where appropriate, in collaboration with the competent organs of the United Nations and with the specialized agencies concerned, standards of safety for protection of health and minimization of danger to life and property (including such standards for labour conditions), and to provide for the application of these standards to its own operations as well as to the operations making use of materials, services, equipment, facilities, and information made available by the Agency or at its request or under its control or supervision; and to provide for the application of these standards, at the request of the parties, to operations under any bilateral or multilateral arrangement, or, at the request of a State, to any of that State’s activities in the field of atomic energy;
7. To acquire or establish any facilities, plant and equipment useful in carrying out its authorized functions, whenever the facilities, plant, and equipment otherwise available to it in the area concerned are inadequate or available only on terms it deems unsatisfactory…

ARTICLE XII: Agency safeguards

1. To examine the design of specialized equipment and facilities, including nuclear reactors, and to approve it only from the viewpoint of assuring that it will not further any military purpose, that it complies with applicable health and safety standards, and that it will permit effective application of the safeguards provided for in this article…

6. To send into the territory of the recipient State or States inspectors, designated by the Agency after consultation with the State or States concerned, who shall have access at all times to all places and data and to any person who by reason of his occupation deals with materials, equipment, or facilities which are required by this Statute to be safeguarded, as necessary to account for source and special fissionable materials supplied and fissionable products and to determine whether there is compliance with the undertaking against use in furtherance of any military purpose referred to in sub-paragraph F-4 of article Xl, with the health and safety measures referred to in sub-paragraph A-2 of this article, and with any other conditions prescribed in the agreement between the Agency and the State or States concerned. Inspectors designated by the Agency shall be accompanied by representatives of the authorities of the State concerned, if that State so requests, provided that the inspectors shall not thereby be delayed or otherwise impeded in the exercise of their functions...

7. In the event of non-compliance and failure by the recipient State or States to take requested corrective steps within a reasonable time, to suspend or terminate assistance and withdraw any materials and equipment made available by the Agency or a member in furtherance of the project...".

The Statute of the IAEA
1957
Source: https://www.iaea.org/about/statute

Countries to develop nuclear programs in 1950-1960s
(not including France, Great Britain, People's Republic of China, the USA, the USSR)

- Argentina
- Brazil
- India
- Iran
- Iraq
- Israel
- Italy
- Japan
- North Korea
- Norway
- Pakistan
- South Africa
- South Korea
- Sweden
- Switzerland
- Taiwan[10]
- West Germany
- Yugoslavia
- etc.

After the speech of President Eisenhower, the US launched the *Atoms for Peace* program to share non-military nuclear technologies with other states. As some American experts noted, this initiative provoked some negative consequences as well. Firstly, the US and some other nuclear suppliers behaved rather thoughtlessly as they supplied countries which did not use nuclear technologies or materials properly or even did not need them at all[11]. Secondly, active export of nuclear technologies led to a situation where many of them were declassified. Atom-related issues were no longer totally covered by the state secret[12]. The risks of nuclear weapons proliferation, by contrast, increased. Thus, the creation of the IAEA was a very important landmark in developing the future nuclear nonproliferation regime.

[10] Indicating Taiwan separately here does not imply recognition of its independent status. We consider Taiwan as a part of the People's Republic of China. – Editor's Note.
[11] Find more: Stoiber C., Glenn J., Kennedy R. et al. Nuclear Nonproliferation – Law and Policy. Proceedings of the Annual Meeting (American Society of International Law) // Cambridge University Press, 1982. Vol. 76, P. 78.
[12] Find more: Nye J. Nonproliferation: A Long-Term Strategy // Foreign Affairs, 1978 (April). Vol. 56. No. 3. P. 604.

FIRST IDEAS TO BAN NUCLEAR TESTS

Due to the spread of nuclear technologies, many countries in the world were concerned with the risks of nuclear weapons proliferation. In parallel with the development of nuclear programs, some states were trying to find collective solutions to prevent the spread of nuclear weapons. First and foremost, many countries worried about nuclear tests. In April 1955, the famous Bandung Conference took place, when 29 countries of Asia and Africa proclaimed the principles of non-interference, non-aggression and respect for each other's sovereignty. Moreover, participants of the Conference "appealed to all the powers concerned to reach agreement to suspend experiments with such [nuclear and thermo-nuclear weapons] weapons"[13].

> ***...disarmament and the prohibition of the production, experimentation and use of nuclear and thermo-nuclear weapons of war are imperative to save mankind and civilization from the fear and prospect of wholesale destruction...".***
>
> **Final Communiqué of the Asian-African conference of Bandung**
> **April 24, 1955**
> *Source: https://www.cvce.eu/en/obj/final_communique_of_the_asian_african_conference_of_bandung_24_april_1955-en-676237bd-72f7-471f-949a-88b6ae513585.html; open data*

The USSR supported the ideas of banning nuclear tests. Already in May 1955, the Soviet Union proposed to conclude a special convention to set limits for the number of armed forces and weapons of the USSR, USA, China, Great Britain and France and other countries, and then to turn to reducing them and to stopping the production of atomic and hydrogen weapons. In November 1957, the International Meeting of Communist and Workers' Parties was held in Moscow. It resulted in adopting the Piece Manifesto which called on all peace-loving forces to fight for an end to the arms race and a ban on the testing, production and the use of nuclear weapons, for the elimination of military blocs and foreign military bases on the territory of other countries, etc.[14]

[13] Find more: Final Communiqué of the Asian-African conference of Bandung (24 April 1955) // CVCE.eu.
[14] Манифест мира, ноябрь 1957 года // Документы XX века.

The first nuclear test of France. Saharan Military Experiments Centre. French Algeria. February 13, 1960
Source: open data

The first nuclear test of China. Lop Nur test site. People's Republic of China. October 16, 1964
Source: open data

In 1958, the USSR unilaterally proclaimed a moratorium on nuclear tests. Later so did the US and Great Britain. All the three nuclear weapons countries respected the moratorium on nuclear tests for 3 years until 1961 when France detonated its first atomic bomb and refused to take the same responsibilities on imposing moratorium on nuclear tests. At that time China was not ready to decline nuclear option either and continued to work on acquiring nuclear status even in the context of deterioration in relations with the USSR. Nevertheless, in 1958, the US, the Soviet Union and Great Britain started negotiations on prohibiting nuclear testing which resulted in the Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water (or Limited Test Ban Treaty, LTBT; or Partial Test Ban Treaty, PTBT). Then only underground tests were allowed.

FIRST IDEAS TO ESTABLISH NUCLEAR-WEAPON-FREE ZONES

In 1950s, the idea of establishing nuclear-weapon-free zones (NWFZs) emerged. The Soviet Union and its allies led the promotion this idea. For them it was a kind of instrument to prevent or to limit the deployment of the American nuclear weapons near their borders.

In the 1950s, the US deployed their tactical nuclear weapons in the territory of their allies within NATO such as Belgium, Great Britain, Greece, Denmark, Spain, Italy, the Netherlands, Turkey and Western Germany. The last one raised so many concerns for the USSR due to risks of revanchism of the German military-political establishment in response to its defeat in World War II.

The Soviet Union supported the initiative by trying to promote it within the London Subcommittee of the Disarmament Commission. Such a zone should include the territory of Poland, Czechoslovakia, and both West Germany and East Germany and to prevent the very practice of deploying nuclear weapons outside national territory. The Rapacki Plan was not widely supported, and such a zone was not established in Central Europe.

The Soviet initiatives of the 1950s to establish nuclear-weapons-free zones in Baltic region, Balkans and Adriatic Sea region, Mediterranean Sea region, Middle East, Far East and Pacific Bassin were declined by the West as well. Anyway, the idea of nuclear-weapons-free zones itself strengthened the trend towards nuclear nonproliferation regime and provoked many discussions on this measure held by countries of other regions.

In 1957, Foreign Minister of Poland Adam Rapacki proposed for the UNGA to create a nuclear-weapon-free zone in Central Europe and to provide the countries of the zone with the guarantees that nuclear weapons would not be used against them. Countries of the zone to be included:

- *Poland*
- *Czechoslovakia*
- *West Germany*
- *East Germany.*

FROM THE IRISH RESOLUTION TO TNCD, ENCD AND NPT

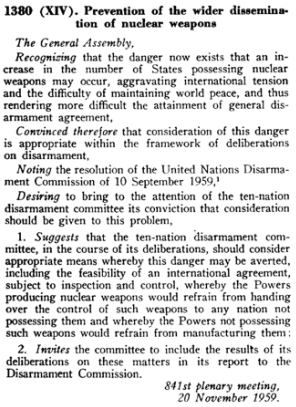
In the late 1950s, the issue of nuclear nonproliferation finally emerged as a distinct topic under the auspices of the UN. Previously the risks of the nuclear weapons spread were always generally discussed primarily in the context of nuclear energy control or disarmament. Such a shift was made with the contribution of Ireland. During the 13th session of the UN GA in October 1958 the Irish Minister of External Affairs Frank Aiken presented a draft resolution addressing the dangers of the wider dissemination of nuclear weapons. If the USSR was ready to support the initiative of Ireland to some certain extent, the US was totally against it and considered the Irish resolution as dangerous and disruptive. At that time the resolution did not pass. But in 1959, during its 14th session, the UN GA adopted a resolution with a suggestion to consider the danger of expanding the nuclear club.

In 1960, the Ten Nation Committee on Disarmament (TNCD) was established. It was a forum on disarmament operating outside the UN system. TNCD included France, Great Britain, the Soviet Union, the US as well as Bulgaria, Canada, Czechoslovakia, Italy, Poland and Romania. So, only representatives of the two opposing blocks were the members of the Committee. Despite the suggestion of the UN, it met several times in 1960 but did not consider the issues of nuclear nonproliferation while focusing more on the general and complete disarmament.

Frank Aiken strongly believed that the increase in number of nuclear weapons states would make the control over nuclear weapons impossible and would raise the risks of nuclear conflict. He thought it would be much better to have an international agreement

to freeze the nuclear club in order to guarantee enduring stability in the world. That was why he proposed his draft resolutions on nuclear nonproliferation to the UN GA each year from 1958 to 1961. Finally, in 1961 the Irish resolution was passed unanimously. That year the US and the USSR initiated the expansion of the TNCD including neutral countries and representatives of the Non-Aligned Movement such as Burma (now Myanmar), Brazil, India, Mexico, Nigeria, Egypt, Sweden and Ethiopia. So the TNCD turned into the Eighteen Nation Committee on Disarmament (ENCD).

> ***...whereby the Powers producing nuclear weapons would refrain from handing over the control of such weapons to any nation not possessing them and whereby the Powers not possessing such weapons would refrain from manufacturing them...».***
>
> **Prevention of the wider dissemination of nuclear weapons**
> **Resolution adopted by the General Assembly during its 14th session, November 20, 1959**
>
> *Source: https://digitallibrary.un.org/record/206353*



1380 (XIV). Prevention of the wider dissemination of nuclear weapons

The General Assembly,

Recognizing that the danger now exists that an increase in the number of States possessing nuclear weapons may occur, aggravating international tension and the difficulty of maintaining world peace, and thus rendering more difficult the attainment of general disarmament agreement,

Convinced therefore that consideration of this danger is appropriate within the framework of deliberations on disarmament,

Noting the resolution of the United Nations Disarmament Commission of 10 September 1959,[1]

Desiring to bring to the attention of the ten-nation disarmament committee its conviction that consideration should be given to this problem,

1. *Suggests* that the ten-nation disarmament committee, in the course of its deliberations, should consider appropriate means whereby this danger may be averted, including the feasibility of an international agreement, subject to inspection and control, whereby the Powers producing nuclear weapons would refrain from handing over the control of such weapons to any nation not possessing them and whereby the Powers not possessing such weapons would refrain from manufacturing them;

2. *Invites* the committee to include the results of its deliberations on these matters in its report to the Disarmament Commission.

841st plenary meeting,
20 November 1959.

Ten Nation Committee on Disarmament (TNCD)	Eighteen Nation Committee on Disarmament (ENCD)
Bulgaria	Brazil
Canada	Burma (Myanmar)
Czechoslovakia	Bulgaria
France	Canada
Great Britain	Czechoslovakia
Italy	Egypt
Poland	Ethiopia
Romania	France
Soviet Union	Great Britain
US	India
	Italy
	Mexico
	Nigeria
	Poland
	Romania
	Soviet Union
	Sweden
	US

As participants of the negotiations noted these eight new members of the Committee were taking active positions considering the problem of nonproliferation. They expressed and promoted the views and opinions of non-nuclear-weapon states, or the majority of

the UN members. For example, India proposed such elements of the future agreement on nonproliferation as the following ones[15]:

1. commitment of nuclear-weapon states not to transfer nuclear weapons or their production technology to other states;
2. commitment of non-nuclear-weapon states not to produce or acquire nuclear weapons;
3. commitment to move towards disarmament and a comprehensive nuclear test ban;
4. commitment of nuclear states not to use nuclear weapons against countries that do not possess them;
5. commitment of nuclear-weapon states to provide non-nuclear-weapon states with security guarantees in case of nuclear threats or nuclear blackmail.

The Indian proposals were motivated to some certain extent by the fact that China had become the fifth nuclear power in 1964 after testing its first nuclear device. But more important was that the question of security assurances for non-nuclear-weapon states were raised in the context of nuclear nonproliferation.

Nevertheless, from 1962 to 1964 no practical measures, except initiatives, proposals and discussions, were taken to develop international agreement on preventing the increase of states possessing nuclear weapons. The main stumbling block was the plans of the US to create Multilateral Forces (MLF) within NATO. It was an American initiative to create a fleet or ships with *Polaris* ballistic missiles, carrying nuclear weapons, manned by multinational crews, and operating under NATO command and control.

The USSR was totally against both direct and indirect transfer of and control over nuclear weapons to non-nuclear-weapon states and their direct and indirect access to such weapons through military alliances or by their own. The Soviet Union was concerned with the risks that some other capitalist countries, especially Western Germany, would acquire nuclear weapons and would join the nuclear arms race. These fears were motivated by the threat that in such a case the nuclear capability of the capitalist block would be advanced much more than the nuclear capabilities of the Warsaw Pact Organization member states. Besides, at this time there was noted a multiple increase in military spending and a build-up of strategic weapons in the US. For example, the number and might of nuclear warheads in the US strategic forces doubled; the number of nuclear warheads of American tactical weapons in Europe increased by 60 percent; the US missile arsenal increased from 45 to 500 strategic missiles, and so on[16]. The rapid accumulation of nuclear warheads was also carried out in the USSR.

The US became much more concerned with the risks of nuclear weapons dissemination as well. In 1964, the People's Republic of China successfully exploded its first atomic bomb. In January 1965, a report was prepared by the Committee on Nuclear Proliferation for American President Lyndon Johnson (1963-1969).

It should be noted that at the same time the negotiations on multilateral nuclear forces within the NATO were rather unsuccessful for the US. By the way, the authors of the report asserted that the world was "fast approaching a point of no return in the prospects

[15] Find more: Тимербаев Р.М. Россия и ядерное нераспространение. 1945-1968. – М.: Наука, 1999. 383 с.
[16] Find more: Проблемы запрещения испытаний и распространения ядерного оружия [Текст] / А.Н. Калядин ; АН СССР, Ин-т мировой экономики и междунар. отношений. - Москва : Наука, 1976. С. 86.

of controlling the spread of nuclear weapons"[17] and that the US "should intensify efforts for a nonproliferation agreement and seek the early conclusion of the widest and most effective possible international treaty on non-dissemination and non-acquisition of nuclear weapons"[18].

> ***...The recent Chinese Communist nuclear explosion has reinforced the belief, increasingly prevalent throughout the world, that nuclear weapons are a distinguishing mark of a world leader, are essential to national security, and are feasible even with modest industrial resources. The Chinese Communist nuclear weapons program has brought particular pressure on India and Japan, which may both be approaching decisions to undertake nuclear weapons programs... Although one might be tempted to accept Indian or Japanese nuclear weapons to counterbalance those of China, we do not believe the spread of nuclear weapons would or could be stopped there. An Indian or Japanese decision to build nuclear weapons would probably produce a chain reaction of similar decisions by other countries, such as Pakistan, Israel and the UAR. In these circumstances, it is unrealistic to hope that Germany and other European countries would not decide to develop their own nuclear weapons...".***
>
> **Report by the Committee on Nuclear Proliferation, USA**
>
> **January 21, 1965**
>
> *Source: https://history.state.gov/historicaldocuments/frus1964-68v11/d64*

In the 1960s, the term nonproliferation was introduced in a wider circulation. It is a very interesting fact that previously other terms were used. It was primarily non-dissemination and non-diffusion. Nonproliferation as a notion had a much wider dimension including both non-dissemination and non-diffusion as well as non-acquisition. Moreover, since that time some states, especially non-nuclear-weapon countries, began to consider nonproliferation in two forms:

1. as non-increase in numbers of countries possessing nuclear weapons (this is the *horizontal* level of nuclear proliferation);
2. as non-increase in numbers of nuclear weapons by nuclear states as well as the advancement of their nuclear capabilities (this is the *vertical* level of nuclear proliferation).

In June 1965, the UN Commission on Disarmament adopted a resolution with the recommendation to the ENCD to develop and prepare for the conclusion an international agreement on nuclear nonproliferation. In July 1965, the ENCD resumed its work. For three years it was negotiating the future Treaty on the Non-Proliferation of Nuclear Weapons (NPT) which was finally opened for a signature on July 1, 1968, in Moscow, Washington and London and entered into force two years later in March 5, 1970. Since then, it has become the cornerstone of the international regime of nuclear nonproliferation. ■

[17] Find more: Report by the Committee on Nuclear Proliferation, USA, January 21, 1965 // US Department of State Office of the Historian.
[18] Ibid.

Ambassador Roland Timerbaev
Russia And Nuclear Nonproliferation, 1945-1968 (1999)

...It is difficult to overestimate the enduring value of the Treaty on the Non-Proliferation of Nuclear Weapons for Russia... already from the end of the 1950s to the early 1960s, nuclear nonproliferation was growing into a priority goal of Soviet foreign policy. In order to achieve the realization of this task, Soviet diplomacy was forced to overcome quite a few obstacles and difficulties standing in the way of achieving Soviet-American agreement on a treaty that would fully meet our national interests.

The complex, multi-track struggle to ensure that the Treaty's provisions were satisfactory for our state, most notably by eliminating the possibility of allowing non-nuclear-weapon states to have control over nuclear weapons in any form and under any pretext, took a lot of time and effort. In Western Europe (and primarily in the Western Germany), but not only there, many perceived the abandonment of plans to create multilateral nuclear forces in NATO by the United States in preference for the NPT on conditions acceptable to the USSR as a kind of Soviet-American fait accompli, and as an establishment of a nuclear duopoly in the nuclear field.

Mainly for this reason, France and the People's Republic of China, which both chose the path of independent nuclear development, refused to join the Treaty at that stage, even though it seemed to be fully in their national security interests. These two nuclear-weapon states joined the NPT only in the 1990s...

Agreement on the draft nonproliferation treaty between the two major nuclear powers, which initially enjoyed undisputed military-political and legal standing for this bilateral process, as official co-chairs of the Geneva-based Eighteen Nation Disarmament Committee (ENDC), and their joint promotion of this draft treaty through two multilateral institutions – the ENDC and the UN General Assembly – coincided with shared efforts to ensure the overall favorable outcome of the 1968 Conference of Non-Nuclear States laid a solid foundation for further concerted actions of both powers to strengthen the nascent nuclear nonproliferation regime... The basis of this nearly continuous cooperation between the two powers since then has been a common strategic interest in preventing new nuclear-weapon states that would threaten their international positions. This cooperation, often confidential, has never stopped – even during the most acute periods of the Cold War...

The end of the Cold War and the US-Russian nuclear competition did not and could not fundamentally change this historical process. The transformation of the world from a unipolar to a multipolar world also cannot reverse this dynamic... The foregoing dictates the need for continuing efforts to improve and strengthen the international system of nonproliferation of nuclear weapons, but it is also clear that this will not and cannot provide a radical, final solution. Only the simultaneous acceptance by the nuclear-weapon states – and necessarily by all such powers, not just Russia and the United States – of adequately responsive steps towards non-nuclear-weapon states that would lead to a gradual blurring of the line between haves and have-nots can pave the way to universal and, most importantly, realistic – not virtual – nuclear nonproliferation.

Source: https://pircenter.org/wp-content/uploads/2024/01/Russia-and-Nuclear-Nonproliferation-1945-1968.-Ch.-8.pdf

PAPER 3.

NPT AS A CORNERSTONE OF THE NUCLEAR NONPROLIFERATION REGIME. THE THREE PILLARS OF NUCLEAR NONPROLIFERATION

Vladimir Orlov

The Treaty on the Non-Proliferation of Nuclear Weapons, or the Nuclear Nonproliferation Treaty (NPT), is a cornerstone of the international security regime. It is a treaty that survived the Cold War and has been serving the international community, global security, and stability for quite a number of decades. And the NPT is mostly healthy and strong in the current fragile international security environment.

By the late 1950s – early 1960s, there was a feeling among policymakers and security analysts in major capitals that soon there would be a few dozen nations with nuclear weapons. It was called *Kennedy's nightmare*. The US President John Kennedy (1961-1963) was quite outspoken about that. According to the declassified documents of the Central Intelligence Agency (CIA) of those times, he was concerned about such countries as Czechoslovakia, Yugoslavia, and some others. The Soviet Union was no less concerned about potential proliferation. *Moscow's nightmare* was Western Germany. It was after World War II (1939-1945), in which the USSR lost 27 million of Soviet lives; imagining that Western Germany would get nuclear weapons in the late 1950s was a real nightmare for the Soviet Union. Of course, there were other potential players and *newcomers* in nuclear domain. And most of them were very close to the borders of the USSR.

In 1962, the Cuban Missile Crisis took place. Just right after it, the two nations, the Soviet Union and the United States, started working really hard on preventing the proliferation of nuclear weapons through legal means. Before that there were discussions, bilateral and multilateral.

Of course, there was pressure from the non-nuclear-weapon states that were also concerned about potential proliferation and nuclear arms race.

Each treaty is a compromise. It is never something perfect, which satisfies the interests of just one player, because then it would not survive. The good news about the NPT is that it is built on three equal pillars: nuclear nonproliferation, nuclear disarmament, and peaceful uses of nuclear energy. It does not matter which pillar is number one, number two, or number three. What matters is that they all should be equal, not ignored, not exaggerated. If or when one of these pillars is inflated or ignored, then this is a problem for the whole architecture of the nuclear nonproliferation regime.

One of the *founding fathers* of the NPT and of the whole nonproliferation regime was a Soviet diplomat Ambassador Roland Timerbaev (1927-2019) as he participated in drafting the Treaty. Also, he took part in negotiating 1971 Agreement on Measures to Reduce the Risk of Outbreak of Nuclear War between the USSR and the United States; 1972 Treaty on The Limitation of Anti-Ballistic Missile Systems (ABM Treaty); the IAEA safeguards system and many other documents that today form a reliable foundation of the nonproliferation regime. PIR Center honors the memory of Ambassador Timerbaev. In his Memory Gallery[19] developed at PIR Center NONPROLIFERATION.WORLD educational platform some of his articles and books, archival materials, speeches and photographs that talk about his life and work can be found. In 2023, PIR Center also published the book *Anthology of Roland Timerbaev*[20], which includes his most outstanding works covering the history of the formation of the international nuclear nonproliferation regime.

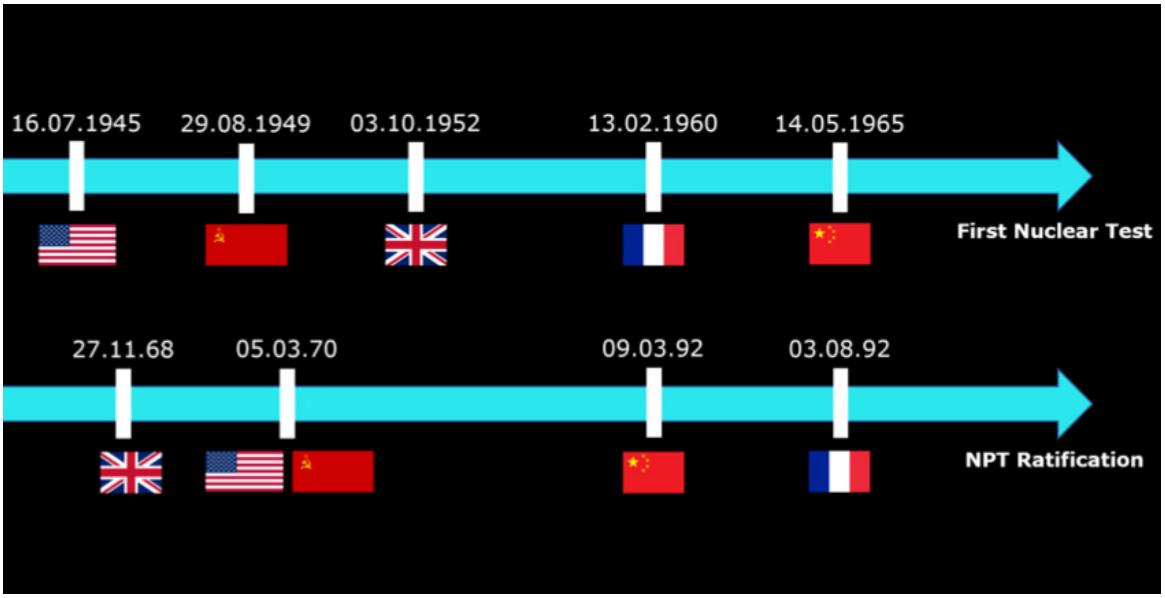
THE NUCLEAR NONPROLIFERATION PILLAR

Nuclear nonproliferation is the essence of the NPT and the essence of the entire nuclear nonproliferation regime. Article I as well as Article II mirror reflect the interests of the *haves* and *have-nots*.

> ***Each nuclear-weapon State Party to the Treaty undertakes not to transfer to any recipient whatsoever nuclear weapons or other nuclear explosive devices or control over such weapons or explosive devices directly, or indirectly; and not in any way to assist, encourage, or induce any non-nuclear-weapon State to manufacture or otherwise acquire nuclear weapons or other nuclear explosive devices, or control over such weapons or explosive devices".***
>
> **Article I of the NPT**
>
> **1968**
>
> *Source: https://disarmament.unoda.org/wmd/nuclear/npt/text/*

According to the NPT, a nuclear-weapon state is one which has manufactured and exploded a nuclear weapon or other nuclear explosive device prior to January 1, 1967. Thus, the official nuclear club includes the US (1945), the USSR/Russia (1949), the UK (1952),

[19] Find more: Roland Timerbaev: memory gallery // NONPROLIFERATION.WORLD: PIR Center education & training platform
[20] Find more: Тимербаев Р.М. Избранное / ПИР-Центр. Москва: ПИР-Пресс, Издательство «Весь мир», 2023. 304 с.



First nuclear test and NPT ratification timeline

France (1960), China (1964). The US, the Soviet Union and the UK signed the NPT in 1968 as its depository states. France and China did not join the NPT immediately for different reasons. They did it much later, only in the 1992.

> ***Each non-nuclear-weapon State Party to the Treaty undertakes not to receive the transfer from any transferor whatsoever of nuclear weapons or other nuclear explosive devices or of control over such weapons or explosive devices directly, or indirectly; not to manufacture or otherwise acquire nuclear weapons or other nuclear explosive devices; and not to seek or receive any assistance in the manufacture of nuclear weapons or other nuclear explosive devices".***
>
> **Article II of the NPT**
> **1968**
> *Source: https://disarmament.unoda.org/wmd/nuclear/npt/text/*

Article II of the NPT mirrors the interests and the obligations of the *have-nots*, or non-nuclear-weapon states. When the negotiators were working on the Article II and its wording, which now are taken for granted, there were a lot of exchanges between the delegations and their capitals.

Nuclear proliferation happens, but at a very, very low level. We have nuclear-weapon-states that are out of the NPT (the DPRK, India, Pakistan). And we have one nation, South Africa, which used to have nuclear weapons, but later, in 1990s, joined the Treaty after destroying its nuclear arsenal. The special case is Israel. Negotiators pretended that Israel did not have nuclear weapons at the time the NPT was signed. No one wanted to bring Israel to this Treaty for different reasons, neither Soviets nor Americans. Israel did not conduct nuclear explosives, but the country knew how to build nuclear weapons even without nuclear testing. Besides, there is the case of South Sudan: the country has not managed to sign the NPT since its independence in 2011, but it has never refused to accede to it in the future.

FOOD FOR THOUGHT [21]

According to experts, in the 1960s, Israel allegedly developed nuclear weapons program, but the country decided that it would not be the first one to introduce nuclear weapons into the Middle East. In 1981, Prime Minister Menachem Begin (1977-1983) expanded this formula, stating that Israel would also not be the second state to introduce nuclear weapons into the Middle East. There is evidence in American literature that back in the late 1960s Israel reached agreements with the US that it would not join the NPT and would continue to pursue a policy of nuclear ambiguity.

THE PEACEFUL USES OF NUCLEAR ENERGY PILLAR

Any treaty is a compromise, but, of course, for the *have-nots* it is unfair. Why do some five countries have better rights, in particular, rights to possess nuclear weapons, while the rest of the participants to the NPT do not? This is why there are some elements which reflect the interests of the *have-nots* that want to play respectfully to the Treaty.

> ***1. Nothing in this Treaty shall be interpreted as affecting the inalienable right of all the Parties to the Treaty to develop research, production and use of nuclear energy for peaceful purposes without discrimination and in conformity with Articles I and II of this Treaty.***
> ***2. All the Parties to the Treaty undertake to facilitate, and have the right to participate in, the fullest possible exchange of equipment, materials and scientific and technological information for the peaceful uses of nuclear energy. Parties to the Treaty in a position to do so shall also co-operate in contributing alone or together with other States or international organizations to the further development of the applications of nuclear energy for peaceful purposes, especially in the territories of non-nuclear-weapon States Party to the Treaty, with due consideration for the needs of the developing areas of the world".***
>
> **Article IV of the NPT**
>
> **1968**
>
> *Source: https://disarmament.unoda.org/wmd/nuclear/npt/text/*

Until country X is caught by the *watchdog* of nuclear nonproliferation, each country has inalienable rights to develop its nuclear energy for peaceful purposes. Even more, all parties to the Treaty undertake to facilitate the right to participate in the fullest possible exchange of equipment, materials and scientific and technological information for peaceful uses of nuclear energy.

The *watchdog* of nuclear nonproliferation is the International Atomic Energy Agency (IAEA). It is an international organization serving to promote peaceful uses of nuclear energy throughout the globe. The IAEA, although getting a lot of pressure, has been quite politicized at those times but still keeps a professional way of approaching things whether it is Iran's ad-

[21] Find more: Smith G., Cobban H. A Blind Eye to Nuclear Proliferation // Foreign Affairs, 1989 (Summer). Vol. 68, No. 3. Pp. 53-70; Evron Y. Israel and the Nuclear Nonproliferation Regime // The Obama Vision and Nuclear Disarmament, 2011 (March). Published by Institute for National Security Studies, Pp. 119-129.

vanced nuclear program, or the situation with the Zaporozhye Nuclear Power Plant (ZNPP), or other quite acute situations with nuclear materials. International inspectors at the IAEA still try to do as good job as possible when the Organization is so much politicized.

International Atomic Energy Agency organizational chart (as of December 31, 2020)
Source:https://www.iaea.org/sites/default/files/publications/reports/2020/gc65-5-orgchart.pdf

THE DISARMAMENT PILLAR

The base of the NPT disarmament pillar is Article VI of the Treaty. Some experts call it the *disarmament article.*

> ***Each of the Parties to the Treaty undertakes to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control".***
>
> **Article VI of the NPT**
> **1968**
> *Source: https://disarmament.unoda.org/wmd/nuclear/npt/text/*

To put it metaphorically, Article VI of the NPT is a bird which has two wings. A bird with one wing is unlikely to fly. Unfortunately, some states tend to read only one part of this Article which refers to nuclear disarmament but ignore the second part devoted to general and complete disarmament. Moreover, each of the parties to the NPT, both *haves* and *have-nots*, undertake to pursue negotiations in good faith on effective measures relating to the cessation of the nuclear arms race at an early date and to nuclear disarmament.

FOOD FOR THOUGHT

Do we have an arms race now? The answers can be different. If you speak quantitatively, then there is no arms race today, although there are two out of the five nuclear-weapon states that are increasing their nuclear arsenals. These are not Russia or the US. These are the UK and China. If we speak qualitatively, then there is a nuclear arms race for sure.

The second part of Article VI states that each of the parties to the Treaty, both the *haves* and *have-nots*, undertake to pursue negotiations on a treaty on general and complete disarmament. This is not a typo or a mistake. It may be the case that some most technologically advanced nations produce some new types of weapons which can be much more efficient than nuclear weapons. At that moment they would be the first to call for nuclear disarmament because they have something more effective. But this is a trap. There is still much work to be done. No doubt, at some point we will be in a cycle when arms control is rebuilt. Very importantly, the institutional memory of the previous arms control success stories or failures should not be lost.

> ***Nothing in this Treaty affects the right of any group of States to conclude regional treaties in order to assure the total absence of nuclear weapons in their respective territories".***
>
> **Article VII of the NPT**
> **1968**
> *Source: https://disarmament.unoda.org/wmd/nuclear/npt/text/*

One should pay attention to Article VII of the NPT, calling for regional treaties in order to assure total absence of nuclear weapons in the respective territories. Basically, the whole landmass of the Southern Hemisphere is already covered by nuclear-weapon-free zones (NWFZs). Starting from Antarctica, there is also the Treaty of Tlatelolco in Latin America and the Caribbean, the Treaty of Rarotonga in the South Pacific, the Treaty of Pelindaba in Africa, and the Treaty of Bangkok in South-East Asia.

In the Northern Hemisphere, the picture is not so good at all. There is only one real nuclear-weapon-free zone there, which is in Central Asia. Of course, it is critically important to build a zone free of nuclear weapons and other weapons of mass destruction in the Middle East. So far, this is too difficult, but the goal is put right. It would be wise to think of creating nuclear-weapon-free zones in some parts of Europe (maybe a corridor or a zone free of nuclear weapons in Central and Eastern Europe) when tensions are reduced. ■

PAPER 4.

THE NEW CHALLENGE AFTER THE COLD WAR: PROLIFERATION OF WEAPONS OF MASS DESTRUCTION. THE 30TH ANNIVERSARY OF THE SVR RUSSIAN FOREIGN INTELLIGENCE SERVICE PUBLIC REPORT (PRIMAKOV REPORT)[22]

Elena Karnaukhova

It is a well-known fact that the Nuclear Nonproliferation Treaty (NPT) is facing new threats and challenges these days. But can we find another historical period after an atomic bomb was tested that would be completely different? Hardly.

One of the most difficult situations in the sphere of nuclear nonproliferation took place in the 1990s after the collapse of the USSR. Those circumstances were reflected in the public report prepared by the specialists of the Russian Foreign Intelligence Service – SVR Russia – which was released in 1993. The report was called *The New Challenge after the Cold War: Proliferation of Weapons of Mass Destruction*.

The group of SVR experts who prepared the report were inspired, motivated and mentored by Evgeny Primakov who was a Director of the Russian Foreign Intelligence Service in those years and Gennady Evstafiev, an outstanding Soviet and Russian intelligence officer and diplomat, and Lieutenant General of the Russian Foreign Intelligence Service. Sometimes the Report is called the *Primakov Report*. Several important theses were asserted in the 1993 SVR Report that are still relevant today and deserve attention.

[22] This Paper is based on: Открытый доклад СВР России за 1993 год. Новый вызов после «Холодной войны»: распространение оружия массового уничтожения // Служба внешней разведки России.

Press Conference of the Russian Foreign Intelligence Service – SVR – devoted to the 1993 Public Report. Evgeny Primakov (*on the left*), Tatiana Samolis (*in the center*), Vyacheslav Trubnikov (*on the right*). January 28, 1993.

Source:http://svr.gov.ru/smi/2021/12/30-let-nazad-bylo-sozdano-press-byuro-sluzhby-vneshney-razvedki-rf-.htm

> ***"Opening the press conference, Director of the SVR Academician Evgeny Primakov noted that the Report – the first public report in the history of the Russian intelligence service – was prepared being based on an analysis of both open data and information obtained by specific methods. This document is devoted to relations between superpowers and countries with different degrees of possession of weapons of mass destruction... Experts note that the data presented is most likely only a small part of the SVR's work in this direction. However, the fact that the Report was released shows that Russian intelligence service is seriously concerned with the process of the proliferation of nuclear weapons in other countries in some cases not subject to control".***
>
> **Kommersant Daily**
> **January 29, 1993**
> **(Unofficial translation)**
> *Source: https://www.kommersant.ru/doc/37168*

MAJOR TRENDS IN THE PROLIFERATION OF WEAPONS OF MASS DESTRUCTION (WMD) AFTER THE COLLAPSE OF THE USSR

The following observations of those times can be found in the SVR Report.

- *Firstly, in the context of the bipolarity collapse territorial disputes intensified and the conflict space expanded. It led to risks of the proliferation of WMD, their use in armed clashes and regional conflicts, and also to the threat of WMD terrorism. The authors of the report drew attention to the fact that in the new historical period, stimulus for a number of countries to go nuclear continued to exist, and even sometimes intensified, while their capabilities increased as well.*

- *Secondly, the main threat, obviously, was defined as the chain: the proliferation of weapons of mass destruction, the possibility of their use in regional conflicts, and in this case the increasing likelihood of the crisis spreading well beyond the borders of the region. Previously, within the Cold War, the danger of using weapons of mass destruction was mainly determined by the fact that a relatively small number of states possessing WMD were directly drawn into a confrontation. Now the likelihood of its use in conflict situations may increase significantly both due to the increase in the number of countries possessing WMD, and due to its transportation to conflict zones from the outside.*

- *Thirdly, the proliferation of WMD was going on, and it had not only horizontal but also vertical level. This process made it politically and psychologically difficult for states possessing or seeking nuclear weapons to renunciate possession or to use them or to conclude new bilateral and multilateral agreements on disarmament and elimination of WMD.*

- *Fourthly, while the US and the USSR/then Russia made a significant progress in developing the negotiation process on reducing their strategic nuclear forces, China still held a stand-alone, self-isolated positions, Great Britain and France, for their part, were not in a hurry to join arms control talks either. In a such context, it was becoming especially obvious that the proliferation of WMD outside the nuclear club would hinder progress in achieving multilateral agreements aimed at reducing or eliminating such weapons. The proliferation of WMD, especially nuclear weapons, undoubtedly could delay the prospect of effective control over strategic arms and could derail it altogether.*

- *Fifthly, when trying to establish strategic parity in their forces participants of the bipolar competition missed the risks of WMD proliferation per se. It was estimated in 1993, that anywhere from 20 to 30 countries had a potential, a capacity to create nuclear, chemical or biological weapons and means of delivery.*

In the SVR Report the following three groups of countries of particular interest were indicated:

- countries that already possess weapons of mass destruction, but do not officially recognize this fact;
- threshold countries, or countries whose leaders have made the appropriate political decisions, and the existing technical and scientific base, developments in the field of creating WMD make it possible for them in the near future to become the real owners of such weapons;
- near-threshold countries, or countries that have adopted a program for the creation (or possession) of weapons of mass destruction, have begun to implement it, but do not yet have the real capabilities to develop WMD-programs.

In the annex to the Report one can find the deep analysis of the risks of the WMD proliferation, including the list of countries which raised concerns for the Report's authors in 1993. Among them were Algeria, Argentina, Brazil, Chili, DPRK, Egypt, India, Iran, Iraq, Israel, Libya, Pakistan, Republic of Korea, South Africa, Syria, Taiwan[23].

[23] Indicating Taiwan separately in this Paper does not imply recognition of its independent status. We consider Taiwan as a part of the People's Republic of China. – Editor's Note.

BASIC INDICATORS OF ACQUIRING WMD

The authors of the SVR Report proposed three groups of basic indicators that a country is going to acquire WMD:

- political;
- economic;
- scientific and technical.

- *Political indicators.* The most important one is a decision made by political leaders. It is impossible to create and develop a WMD program when such decision is absent. But, usually, such a political decision as the creation of WMD is kept secret, and the fact of its adoption can be recorded either directly – by intelligence means, or by indirect data. The following signs can show that such a decision has been made:

  - Non-adherence to treaties aimed at limiting or renouncing the production and possession of weapons of mass destruction, as well as, more broadly, non-participation in the WMD-related international negotiations and forums.
  - Refusal to place its facilities under international control, attempts to prevent relevant inspections of international organizations or limit their activities.
  - Creation of a structure directly subordinate to the highest political leadership or army command and endowed with special powers, with functions that clearly do not correspond to those declared for this body.
  - The creation of special units in state foreign economic bodies or intelligence services, vested with special rights and with greater financial capabilities for purchasing raw materials, equipment, and samples of equipment abroad. Formation for the same purpose of private firms associated with special agencies.
  - Active lobbying activities in favor of the creation of WMD by influential political forces, parties or groups close to the highest authority.
  - Psychological preparation of the public for the adoption of a military doctrine providing for the use of weapons of mass destruction (using the motives of *fear*, *containment*, *victory*, *last resort*, etc.).
  - Open or covert support for countries that have practically taken the path of creating WMD.

- *Economic indicators.* This includes the scale of the military budget, or more precisely, the share of military expenditures in the state budget. It is rather strange if a country, for example, has excessive military spending but has limited financial capabilities and an underdeveloped economy. The main problem with the economic indicators in general is that information about military spending is either not published or is disguised by inclusion in other budget items. Sometimes it can be very difficult to determine and understand the structure of military expenditures.

- *Scientific and technical indicators.* This includes technical factors associated primarily with the possibility of obtaining raw materials and intermediate materials, semi-finished products necessary for the production of WMD; provision of national scientific and technical programs with personnel and the presence in the country of a system for training qualified specialists in the relevant branches of science and technology; the functioning of modern scientific centers in which the development of proprietary technology and the construction of explosive devices is carried out.

RISKS OF THE WMD TERRORISM

Additionally, the authors of the report paid attention to the problem of WMD terrorism. From 1960s to 1980s about 150 different WMD-related incidents were counted in several states. Among them were explosions, attacks, murders and kidnappings of employees, theft of fissile materials and equipment at various nuclear facilities. The authors wrote that the much more serious concerns were caused by the growing interest of international mafia structures in organizing illegal trade in fissile and other especially dangerous materials, documentation on WMD technologies, and individual components for the manufacture of nuclear explosive devices. Such activities could be aimed both at getting profits or at blackmailing.

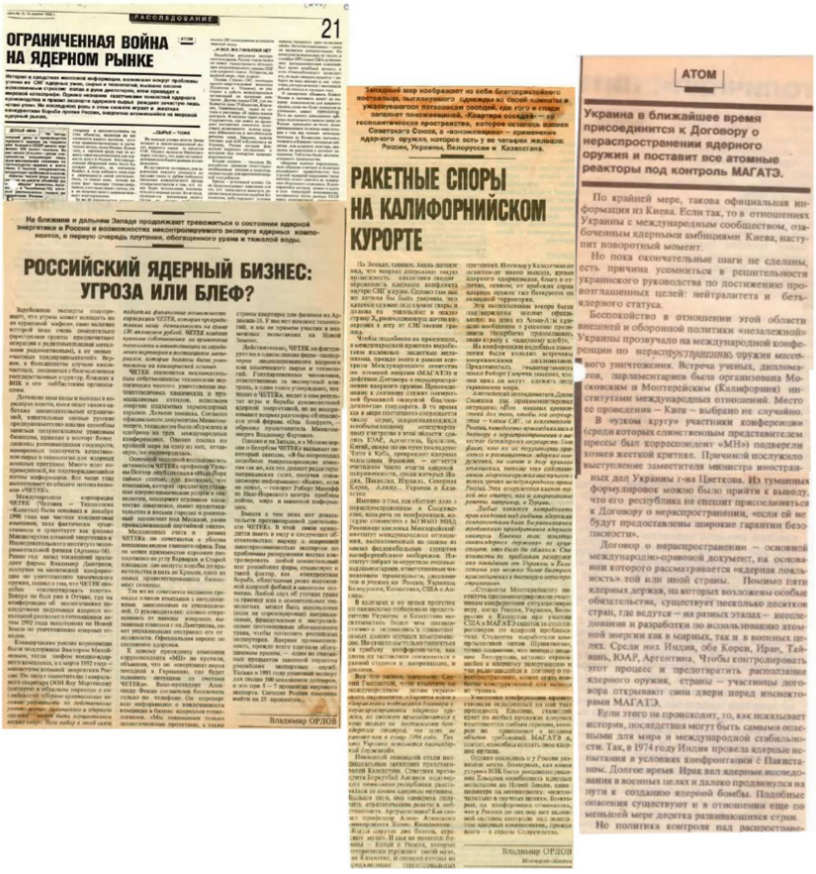
SOVIET NUCLEAR WEAPON LEGACY

The 1990s were a very difficult period in modern Russian history. One of the difficult issues to be settled by the Russian government was the nuclear weapon legacy of the Soviet Union. The strategic nuclear weapons of the Soviet Union were concentrated in the following Soviet republics: Belarus, Kazakhstan, Russia, and Ukraine. When the USSR collapsed, Russia was internationally recognized in late 1991 as the legal successor state to the Soviet Union, which referred to its nuclear status as well. And the task emerged for Russia to consolidate all the strategic nuclear weapons deployed in newly independent Belarus, Kazakhstan, and Ukraine.

> ***"The problem we had to deal with was that nuclear weapons were deployed in all the Soviet Union republics in early 1991. Strategic nuclear weapons were stored in Russia, Ukraine, Kazakhstan and Belarus. The total number of strategic warheads in the territories of these countries was 12.000. This is accurate data. At the conclusion of the START I, these data were exchanged between the United States and the Soviet Union. As for tactical warheads, there were 15.000. But this is an estimate from foreign sources, there was no official data on this issue. All of them were taken to Russia for further destruction before July 1, 1992, and there were no problems with them. It was much more complicated with strategic weapons. First of all, the question arose: who should ratify START I? One Russia? Commonwealth of Independent States? Or just Russia as well as Ukraine, Kazakhstan and Belarus?".***
>
> **Ambassador Yuri Nazarkin,**
> **Head of the Soviet delegation during the talks with the US on the START I, then head of the Russian elegation in negotiations with Ukraine, Belarus and Kazakhstan regarding their participation in the START I implementation as non-nuclear-weapon countries**
> **(Unofficial translation)**
> *Source: https://pircenter.org/wp-content/uploads/2022/11/22-06-10-INF-SI-RUS-%E2%84%9613-39-2022.pdf*

In 1992, Belarus, Kazakhstan, and Ukraine signed the Lisbon Protocol to START I, which had been concluded by the US and the USSR in 1991. Under the Lisbon Protocol the three countries promised to join the NPT as non-nuclear-weapon states. This process was not so easy, especially in the case of Ukraine. At that time the United States provided material and financial assistance to the post-Soviet republics for the withdrawal of nuclear weapons from their territories to the Russian Federation, as well as to Russia itself within

the framework of the Cooperative Threat Reduction (CTR) Program (or *Nunn-Lugar* Program, named after the two US senators Sam Nunn and Richard Lugar) and the United States-Russia Highly Enriched Uranium Purchase Agreement (HEU-LEU Agreement, or *Megatons to Megawatts* Program).



ОГРАНИЧЕННАЯ ВОЙНА НА ЯДЕРНОМ РЫНКЕ

РОССИЙСКИЙ ЯДЕРНЫЙ БИЗНЕС: УГРОЗА ИЛИ БЛЕФ?

РАКЕТНЫЕ СПОРЫ НА КАЛИФОРНИЙСКОМ КУРОРТЕ

АТОМ

Украина в ближайшее время присоединится к Договору о нераспространении ядерного оружия и поставит все атомные реакторы под контроль МАГАТЭ.

Some of the publications on the Soviet nuclear weapon legacy prepared by Dr. Vladimir Orlov, PIR Center Founding Director, in early 1990s when he was a journalist of *Moskovskie Novosti* (*Moscow News*)

Source: https://www.orloff.world/publikacii-1992

It started in 1991, when the sudden collapse of the Soviet Union presented Russia, Ukraine and other successor states with an enormous challenge: how to make sure that an estimated 25.000 nuclear weapons, most of which were sitting in far-flung and often poorly secured sites, did not fall into the hands of criminals and terrorists. It was up to General Maslin, who oversaw the 30.000 soldiers and engineers charged with maintaining Russia's nuclear portfolio, to come up with an answer. He spent three years persuading Ukraine, Kazakhstan and Belarus to hand over their atomic inheritance… …General Maslin didn't just secure the warheads; under bilateral agreements with the United States, he oversaw Russia's partial nuclear disarmament, eliminating about 2,000 a year".

The New York Times

March 9, 2022

Source: https://www.nytimes.com/2022/03/09/world/europe/evgeny-maslin-dead.html

BRAIN DRAIN

The authors of the 1993 SVR Report stressed that after the collapse of the Soviet Union, the issues of the Soviet nuclear weapon legacy made it more difficult to fight against WMD-proliferation. The problem of brain drain emerged. Given the political instability in some territories of the former Soviet Union, the problem of the physical safety of nuclear arsenals also arose. It became more urgent to ensure reliable control over radioactive and other hazardous materials in WMD creation centers, research laboratories and enterprises using certain types of nuclear raw materials such as radioactive isotopes or low enriched uranium.

NUCLEAR WARHEADS FOR IRAN?

The New York Times

West Presses 2 Ex-SovietRepublics on Weapons

Trust and Verify

The Bulletin of the Verification Technology Information Centre

No. 27 April 1992

Soviet nuclear warheads to Iran?

Some fake news in the Western media about the brain drain as well as illegal export of technologies and raw materials related to the production of weapons of mass destruction from the territories of the former Soviet republics. 1990s.

Source:https://www.vertic.org/media/assets/TV/TV27.pdf; https://www.washingtonpost.com/archive/opinions/1992/10/12/nuclear-warheads-for-iran/c92ac9f4-4479-4b7e-a885-14150f3e87f4/; https://www.nytimes.com/1992/03/17/IHT-west-presses-2-exsovietrepublics-on-weapons.html

> ***The SVR Report highlights the need to strengthen security of the Russian nuclear arsenals and of the control on the process of nuclear brain drain. In the opinion of the Academician [Evgeny Primakov], it is too early to talk about the outflow of the Russian scientists and engineers engaged in the nuclear cycle, because neither SVR nor Western intelligence services have serious evidence that one of them is already working in this specialty abroad. The information that gets into the media from time to time, usually are not confirmed and, according to the SVR, may come from circles interested in distracting Russian intelligence units from their main responsibility. Today, however, the danger is posed by those professionals who work in the fields closed to nuclear one and who, when travelling abroad, can be used to develop production of certain nuclear weapons components. ...there are attempts to remove radioactive substances from Russia, but at the level of particular individuals and structures. In addition, it is not the components of nuclear weapons that are being exported, but the low enriched materials used for industrial purposes. All attempts are being made at amateur level, but the Russian intelligence service already notes a tendency to establish strong export channels".***
>
> **Kommersant Daily**
> **January 29, 1993**
> **(Unofficial translation)**
> *Source: https://www.kommersant.ru/doc/37168*

In 1990s, there were so much news in the Western media about the brain drain as well as illegal export of technologies and raw materials related to the production of WMD from the territories of the former Soviet republics. Of course, such problems existed, but there was much more speculation and even targeted disinformation than reliable facts. As the authors of the Report wrote, the Russian Foreign Intelligence Service did not have establish and prove information that the Russian specialists were working in other countries to create or develop WMD production. Besides, the news that the former Soviet nuclear warheads and nuclear shells previously located in Kazakhstan were transported to Iran were not true. The same situation was with the news about the smuggling of Russian enriched uranium, plutonium and other nuclear materials in Europe. From the opinion of the SVR experts, such disinformation could be characterized as *active measures* in the interests of those foreign companies that would like to avoid competition with Russian and other suppliers in the global market for fissile materials.

FURTHER STRENGTHENING OF WMD-RELATED INTERNATIONAL NORMS AND REGIME

The authors of the Report noted the importance of developing international norms and internal regulations within the export control regime including the missile control regime. They also raised the problem of the effectiveness of existing international regimes to prevent the WMD proliferation. One of the most important theses in this regard is the following ones.

- It is necessary to firmly understand that the effectiveness of mechanisms for limiting the proliferation of WMD can be ensured only when they are based on the coincidence of the goals of each and every state with the goals of the entire world community.
- Much depends on how decisively the leading states of the world finally move away from the stereotypes of the past, one of them is the division of *threshold* and *near-threshold* countries into *friendly* and *unfriendly* with all the consequences of such a political double standard.
- An important incentive for solving the problem of WMD nonproliferation should be measures to reduce nuclear weapons by countries belonging to the *nuclear club*. The Strategic Arms Reduction Treaties (START I and START II), concluded at the beginning of 1990s, sharply reduce the number of warheads held by Russia and the United States. However, the effect could be more significant if other members of the *nuclear club* – China, Great Britain, France – also took steps towards reducing their own nuclear weapons.
- In 1995, the Treaty on the Non-Proliferation of Nuclear Weapons expires. It is necessary to do everything not only to ensure that it continues to operate, but also to jointly find the ways to increase its effectiveness.

In 1995, the NPT was indefinitely extended despite all the challenges and threats, criticism and drawbacks. It is still a cornerstone of the entire nonproliferation regime which

has always demonstrated its ability to adopt to the new situation in the context of geopolitical or technological transformations. And, of course, that is how it should be in the decades to come.

30TH ANNIVERSARY OF THE 1993 SVR REPORT

In 2023, the 30th anniversary of the 1993 SVR Report was marked. As it can be seen, many theses proposed by its authors are still relevant nowadays. This report was a result of the very hard work, intellectual efforts and in-depth analysis of the Russian intelligence specialists.

> ***"The Primakov Report is still a model of the intelligence services analytical work and their ability to conduct a dialogue with society. Thanks to the authors of the Report, the world has seen that Russia is able to speak the language of facts and verified arguments, and no matter the circumstances, to participate independently in shaping the global nonproliferation and disarmament agenda. And that on this front, Russia is proactive, offensive, confident – but not reactive, not justified".***
>
> **Vladimir Orlov**
> **Kommersant Daily**
> **January 27, 2023**
> *Source: https://www.kommersant.ru/doc/5785666*

PIR Center cherishes the memory of Lieutenant General Gennady Evstafiev (1938-2013) who contributed to the preparation of the 1993 SVR Report. He was an extremely open-minded person with extraordinary professionalism who consistently promoted the peaceful coexistence of nuclear powers and the importance of a dialogue between them. PIR Center develops a Memory Gallery[24] comprised of the facts from his biography, his papers, memories, and photographs that describe his professional and personal growth.

In 2023, PIR Center published the book *Anthology of Gennady Evstafiev*[25], timed to coincide with the 85th anniversary of his birth. The Anthology includes articles by Gennady Evstafiev, published at different times by PIR Center and devoted to the most controversial issues in the field of global security – from the future of the nuclear nonproliferation regime to the prospects for development of unmanned aerial vehicles (UAVs). Some of his ideas and works as well as the 1993 SVR Report laid the methodology foundation of PIR Center's own Report *New Nuclear Nine? Assessing Nuclear Proliferation Threats in the World*[26], the second edition of which was published in 2023. ■

[24] Find more: Gennady Evstafiev: memory gallery // NONPROLIFERATION.WORLD: PIR Center education & training platform.
[25] Find more: Евстафьев Г.М. Избранное. К 85-летию со дня рождения / Научный центр международных исследований «ПИР» (ПИР-Центр) / Предисловие В.А. Орлова. Москва: Издательство «Весь мир»; ПИР-Пресс, 2023. 192 с.
[26] Find more: Новая ядерная девятка? Оценка угроз распространения ядерного оружия в мире. Доклад. Издание 2-е (исправленное и дополненное) / Ред. В.А. Орлов, С.Д. Семенов. М.: ПИР-Пресс, 2023. – 230 с. – (ПИР-Библиотека - книжная серия).

PAPER 5.

THE NPT REVIEW PROCESS. WHAT IS IT AND DO WE REALLY NEED IT?

Vladimir Orlov

The Nuclear Nonproliferation Treaty (NPT) was signed and opened for signature in 1968 and it entered into force in 1970. Every five years since 1975 parties to the Treaty have met to review the Treaty. The major purpose of the NPT review process is to do a check-up of its compliance and to discuss what should be adjusted to help the Treaty strengthen the nuclear nonproliferation regime. 25 years after the entry into force of the NPT its state parties were to decide how to extend the Treaty as from the very beginning it was signed only for a 25-years term, and that was an exceptional case.

All the NPT review conferences are unique in their own way in terms of geopolitical context, the atmosphere of discussions and results. Some conferences did it better than others. In 2005, after the 7th NPT Review Conference, for example, Soviet/Russian diplomat Ambassador Roland Timerbaev, one of the *founding fathers* of the NPT, noted that there were always cycles, ups and downs for the NPT review conferences and the Treaty itself.

NPT review conferences have become an important verification mechanism for the NPT. Between 1970 and 2024 ten NPT review conferences took place in the following years: 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015, 2022. Before the 10th NPT Review Conference in 2022, the NPT review cycle lasted for seven years due to the COVID-19 pandemic and the subsequent closure of the state borders. Those circumstances made it impossible for many official delegations to come to the UN headquarter in New York, the US, to take part in the review process in 2020. Thus, it was postponed (even twice).

By the end of each review conference state parties prepare the final outcome, or final document which set out the main problems in the functioning of the nuclear nonproliferation regime and the solutions and plans of action for the future. Traditionally, it has to be adopted by consensus. The following NPT review conferences ended without a final document: 1980, 1990, 1995 (although a decision was taken this year to extend the Treaty indefinitely), 2005, 2015, 2022. The absence of the final outcome is not a tragedy for the NPT review process, but it always provokes heated discussions about the relevance of nuclear nonproliferation regime and its (non-)compliance. In general, NPT review conferences can be viewed both as a bureaucratic and a political process.

In this Paper the author will concentrate on the two most interesting cases: the 1995 NPT Review and Extension Conference and the 2022 NPT Review Conference[27].

[27] Since 1995 Vladimir Orlov has taken part in the work of all the NPT review conferences. Since 2010 he has taken part in the NPT review process as a member of the Russian official delegation and its advisor (most recently, in August 2022).

CASE ONE: 1995 NPT REVIEW AND EXTENSION CONFERENCE

The 1995 NPT Review and Extension Conference took place on April 17-May 12, 1995. It resulted in three main decisions – Strengthening the Review Process for the Treaty, Principles and Objectives for Nuclear Non-Proliferation and Disarmament, and Indefinite Extension of the Treaty on the Non-Proliferation of Nuclear Weapons – as well as the Resolution on the Middle East.

> *New York, 1995, April, spring, beautiful weather. I was a young nonproliferation expert who got to spend four weeks of the NPT Review Conference with the expert community there and to meet a number of very bright people. Sergey Kislyak, Gennady Evstafiev, Evgeny Maslin, Roland Timerbaev – all those people were either in the Russian official delegation or somewhere around. Speaking of the 1995 Review Conference, I saw how much importance my country, Russia, put into the 1995 Conference. It was also important for two other depository states, the United States and the United Kingdom. It was in April and May 1995, when the fate of the international nuclear nonproliferation regime was decided".*
>
> **Vladimir Orlov**

Article X.2 of the NPT said that "25 years after the entry into force of the Treaty, a conference shall be convened to decide whether the Treaty shall continue in force indefinitely or shall be extended for an additional fixed period or periods"[28]. So, there were three options regarding its further extension. The first option was to extend the Treaty *indefinitely*. The second option was the extension of the Treaty for an additional *fixed period of time*, for example, again for 25 years, and after that another conference should be convened to decide the future of the NPT. The third option was *rolling extension* or extension in a number of periods of time: 25 *years after* 25 *years*. The majority of state parties to the NPT should make a decision[29].

The future of the NPT and of the nuclear nonproliferation regime were clearly at stake at that moment. Moscow believed that indefinite extension would better serve the needs of Russia and also the needs of the Treaty. Such a decision would prove the importance of the NPT and would remove a *headache* from future NPT review conferences. Russia had a consensus on that with the United States and the United Kingdom. But all three countries were less sure whether they would have a general consensus at the Conference, as there were some *have-nots* who took a very radical position regarding the NPT and its compliance. Without questioning the value of the Treaty, they believed that nuclear-weapon states did not work really hard on Article VI of the Treaty. There were other reasons for criticism as well, and one could not ignore it.

Good conferences are well-prepared conferences. One voice could really matter. Before the Conference some lobbying and preparatory work were done by the depositary states and some other like-minded countries that had believed in the importance of the indefinite extension of the Treaty.

---

[28] Treaty on the Non-Proliferation of Nuclear Weapons, 1968 // United Nations Office for Disarmament Affairs.
[29] Ibid.

There were others, like Ambassador Roland Timerbaev, who believed that indefinite extension of the NPT probably would not be the best solution. He thought that if the Treaty was extended indefinitely, there would have been no way to put pressure on those who are not in full compliance with the Treaty. He personally and some others were not critical of the Treaty itself but of the extension period. The question was for how long to extend the Treaty, not whether it should be extended or not.

The Conference started in a very positive way and was extremely well facilitated by President-designate of the Conference Ambassador Jayantha Dhanapala, a Sri Lankan diplomat. He wanted a positive result for the NPT Review and Extension Conference without a split between the majority and the minority. His work was aimed at building up the spirit of consensus.

The main goals of the 1995 Review and Extension Conference were to extend the Treaty, define the period of extension in accordance with the Article X.2, to review the operation and implementation of the Treaty, to work out recommendations to increase the effectiveness of the Treaty, and to assist in achieving the universal status of the Treaty. Extension, the first point, was successful. Review was done, but no final document was achieved. Recommendations to increase the effectiveness of the Treaty were provided as well. In regard to assisting and achieving the universal status, there were mixed results. Moreover, the Resolution on the Middle East was adopted, but, unfortunately, it was not as strong as it should have been.

It became clear that there was a majority, more than 100 state parties, that support an indefinite extension of the Treaty without any preconditions. There were some who suggested that other documents should be adopted to strengthen the Treaty, what should be considered to be positive. Of course, there were a few dozen hesitant participants. Russia had to work hard to find the delegations of such countries as Moldova and Turkmenistan, for example, to make sure that in case the voting procedure was to be called, they would hopefully vote for the indefinite extension of the Treaty. When Russian representatives realized that there was a majority of the NPT indefinite extension supporters, it became easier for them to discuss the issue with those who hesitated.

By the end of the Conference Ambassador Jayantha Dhanapala understood that the moment was ripe for adopting the decision on the extension and on the package of documents. The Iranian delegation demonstrated that they were not particularly happy about how it all was achieved, and the delegation of the DPRK decided to leave at the moment of decision-making, but they did not say no. The decision on the NPT indefinite extension was achieved not by consensus, but without a vote, so that there was no split.

As one of the foreign participants of the Conference said to the author of this Paper, *the surgery has been a success, the patient is alive but is still in the emergency room*. The Treaty was extended indefinitely, but the problems associated with the international nuclear nonproliferation regime could not evaporate with that decision. It was important to start addressing practical problems. It was already in 1998, three years after the success of the 1995 NPT Review and Extension Conference, when India and Pakistan conducted their nuclear and thermonuclear tests, which, of course, questioned the sustainability of the NPT regime.

> *In the late 1990s, the relations between Russia and the US became more strained. There has never been a honeymoon in our relations, but the late 1990's was clearly an indicator of decline. Some wanted to establish their own rules by bombing Serbia, invading Iraq under the slogans of fighting nuclear proliferation, completely misleading, then creating its own list of the proliferation demons. The world did not march together with the United States in that direction, but the cracks in the relations between the Nuclear Five became more evident. Obviously, after Russia returned its sovereignty over the Crimea in 2014, it became clear that the previous era in international relations was completely over. Russia accurately signaled that we need to reshape the global balance. Russia's voice was ignored. One of the results of that was the 2015 NPT Review Conference. There was no final document because Russia, the United States and the United Kingdom failed to work together like they did in 1995".*
>
> **Vladimir Orlov**

CASE TWO: 2022 NPT REVIEW CONFERENCE

The 10th NPT Review Conference was planned to be held in Spring 2020, but the COVID-19 pandemic broke out and the NPT Review Conference was postponed. It took place on August 1-26, 2022, and was overshadowed by the situation in Ukraine.

> ***It is impossible to ignore the fact that a number of influential states in the review process, both nuclear and nonnuclear – from the United States, Great Britain and France to Switzerland, Japan and New Zealand – have imposed tough sanctions on Russia, and they are categorized by Russia as unfriendly countries.***
>
> ***Building partnerships and seeking compromises with those who apply stranglehold on you, and, in some cases, provoke you by supplying arms to your opponent is both an unrealistic and humiliating endeavor which should be avoided. Western states that would like to turn the Review Conference into a Russia trial should consider which regime they want to strengthen more: the Kiev one or nuclear nonproliferation?***
>
> ***Russia will be able to achieve maximum efficiency only in closer interaction with formal and informal groupings at the Conference. Given the excessive politicization of the forthcoming NPT Review Conference, the practice, when compromise proposals which were worked out by the diplomats of the superpowers were made on behalf of neutral states, may be in demand".***
>
> ***NPT Review Conference: The Limits of the Possible***
> **Vladimir Orlov and Sergey Semenov**
> ***Security Index* Occasional Paper Series. №15 (41). 2022.**
> *Source: https://pircenter.org/wp-content/uploads/2022/11/22-07-27-INF-SI-RUS-%E2%84%9615-41-2022.pdf*

The 2022 NPT Review Conference was excessively politicized. Even in a hostile situation it could be possible to reach a compromise, but one should remember that a compromise is always what both parties want, not just one. Russia was obviously interested in a successful result of the Conference, however, it did not need a final document at any price. The 10th NPT Review Conference should have been concluded with an adoption of a balanced and realistic document which would reflect all significant issues of the nu-

clear nonproliferation regime: both well-publicized disarmament issues and less visible aspects, such as IAEA safeguards, export controls, and the nuclear security. Russia was in a position to facilitate the adoption of such a document in cooperation with the key actors in the Conference, as well as to strengthen the NPT.

It was the first NPT review conference when China played extremely energetically, very independently, and it was clearly explaining its own interests, particularly concerning AUKUS. Positions of China and Russia were very close in most cases, but the *collective West*, led by the United States, the United Kingdom and France at that particular Conference, decided to diplomatically *attack* Russia and only Russia. One specific case was chosen: *Russia was doing something wrong with the Zaporozhye Nuclear Power Plant (ZNPP) on its sovereign territory*. That was just a politically motivated show and a blame game. It was very unfortunate that instead of strengthening the Treaty, the *collective West* preferred to strengthen the Kiev regime, seeking to punish Russia.

"The Conference expresses its grave concern for the military activities conducted near or at nuclear power plants and other facilities or locations subject to safeguards under Ukraine's comprehensive safeguards agreement, in particular the Zaporizhzya nuclear power plant, as well as the loss of control by the competent Ukrainian authorities over such locations as a result of those military activities, and their profound negative impact on safety, security, including physical protection of nuclear material, and safeguards.

The Conference stresses the paramount importance of ensuring control by Ukraine's competent authorities of nuclear facilities and other locations subject to IAEA safeguards located in armed conflict areas, such as the Zaporizhzya nuclear power plant and other facilities and locations within Ukraine, and of providing access to the IAEA in order to implement safeguards activities effectively and safely for the purpose of ensuring that nuclear material is not diverted to nuclear weapons or nuclear explosive devices.

The Conference expresses grave concern with the safety and security of Ukraine's nuclear facilities and materials, in particular the Zaporizhzhya Nuclear Power Plant, and expresses appreciation for the IAEA's and its Director General's efforts to address this concern.

The Conference encourages States parties to support the IAEA Director General's efforts to restore the safety and security of Ukraine's nuclear facilities and materials, within its internationally recognized borders.

The Conference supports the efforts of the Director General of the IAEA to seek access to enable the IAEA to undertake urgent safeguards activities to verify the status of the reactors and inventories of nuclear material in armed conflict areas, including at the Zaporizhzya nuclear power plant and other locations in Ukraine, and to ensure the non-diversion of nuclear material from peaceful activities at those locations".

Draft Final Document
2020 Review Conference of the Parties
to the Treaty on the Non-Proliferation of Nuclear Weapons

Source: https://www.un.org/en/conferences/npt2020/documents

The President-designate of the Conference, Ambassador Gustavo Zlauvinen, an Argentinian diplomat, and his team did their best, but because of the pressure and provocations it was too difficult, close to impossible, to find language that would satisfy everybody.

From the very first days of the Conference, representatives of the Russian official delegation were sending a crystal-clear signal that nothing related to the sovereignty of the Russian Federation should be raised in the final document. Some delegations were very much spoiled by the fact that Russia had always been one of the most neatly acting players. There were quite a number of delegations that were like-minded and that were very unhappy about how the *collective West* was playing it. Some of them were very articulate: Iranians, Syrians, Nicaraguans, Belarusian, etc. The whole review cycle and the final document were sacrificed.

> ***"As I said before, it was expected that it would be very difficult to get a final document by consensus because there were many conflicting views on many relevant issues such as the WMD-free zone in the Middle East, the Iranian nuclear program, the DPRK nuclear arsenal, lack of progress in nuclear disarmament, etc. Previous review conferences had failed to reach consensus on a final document due to one specific issue. For example, the 2015 RevCon failed to reach consensus on its final document due to the diverging positions of some state parties regarding language on the Middle East. But ahead of the Tenth NPT RevCon we were facing several complex and difficult issues, not just one. So, I was trying to push delegations to come to a common understanding of the majority of these issues just to prove that we could continue to work together… Even if we did not manage to get a final document by consensus, I believe that the Tenth NPT RevCon proved that state parties were still able to discuss all NPT-related issues, to engage and negotiate with each other, and even to agree on some critical issues under the Treaty. I do not think that the success of an NPT review conference should be measured only by the fact that a final document is agreed or not. In our case, and for four weeks, delegations from 161 state parties managed to discuss and negotiate nuclear related issues, agreeing on some of them and disagreeing on others. That's the way the process work".***
>
> **Ambassador Gustavo Zlauvinen, President-designate of the 10th NPT Review Conference, in an interview for PIR Center**
>
> *Source: https://pircenter.org/wp-content/uploads/2023/02/%E2%84%961-35-2023.-The-Tenth-NPT-Review-Conference-2022-Chronicle-of-the-Failure-Foretold.pdf*

CONCLUSION

The 2022 NPT Review Conference was held in very sharp contrast with the 1995 NPT Review and Extension Conference. Why did the 2022 Conference fail? There can be identified the main three reasons. First, excessive politicization of the Conference which was provoked by the *collective West*. Second, the situation around the ZNPP was taken as a pretext to put diplomatic pressure on Russia, while the Ukrainians were really attacking it as well as the Kursk Nuclear Power Plant, but nobody wanted to discuss that. Third, ignorance of Russia's position, one-sided draft documents, which could not be accepted.

Nevertheless, the 10th NPT Review Conference was finally held despite all the postponements and some other geopolitical circumstances. There was no final document, but the parties managed to exchange their views, though sometimes in an unproductive and hostile way. Of course, the NPT member states should continue the review process and meet from time to time, but maybe not in New York.

> ***We got used to being constantly blamed and take it easy. History will judge everyone; you should not worry. Some countries want to turn the [Tenth] NPT RevCon into a show trial for Ukraine, which has nothing to do with reality, with the nuclear nonproliferation agenda. And if it does, it is only indirect – in the context of the situation around the Zaporozhye Nuclear Power Plant. No one is telling the truth: Ukraine is shelling nuclear power plant, and no one is talking about it here. European countries show no sense of self-preservation. They are amazingly carefree. European countries could reason with their so-called Ukrainian partners – stop giving them money and weapons. But they do not do this, and all in the name of a great goal to act as a united front against Russia".***
>
> **Igor Vishnevetsky, Deputy Head of the Russian delegation to the 10th NPT RevCon and Deputy Head of the Department for Nonproliferation and Arms Control of the Russian Foreign Ministry, in an interview for PIR Center**
>
> *Source: https://pircenter.org/wp-content/uploads/2023/02/%E2%84%961-35-2023.-The-Tenth-NPT-Review-Conference-2022-Chronicle-of-the-Failure-Foretold.pdf*

One should remember that the review cycle gives an opportunity for all the state parties, for like-minded and very differently minded countries, both nuclear-weapon and non-nuclear-weapon ones, to express themselves. It is very unfortunate that the NPT member states are unwilling to find compromises and that there is a strong *political split* between nuclear-weapon states, in particular, between Russia and the USA. The truth is that between August 2022 and now there has been zero progress in improving the atmosphere in international affairs which is quite important to preserve and promote the NPT spirit. ■

PAPER 6 .

PRESSURE POINTS OF THE NUCLEAR NONPROLIFERATION REGIME

Vladimir Orlov

MAJOR PRESSURE POINTS OF GLOBAL IMPORTANCE

One should pay attention to today's situation in the sphere of nuclear nonproliferation. Some pressure points can be identified which will probably exist for some years to come and will be a part of the checklists at future Nuclear Nonproliferation Treaty (NPT) review conferences.

▶ *Pressure point №1 – The lack of universality of the NPT*

The NPT is remarkably strong because a vast majority of nations have been supporting it. Believe it or not, even Palestine[30] and Taiwan[31], which legally cannot be parties to the Treaty, are such parties. One may say that the participation is larger than the globe. Unfortunately, not exactly like that because there are several nations that are still outside of this Treaty.

Statuses of countries in relation to the NPT (as of February 2024)
©Vladimir Orlov

[30] Russia has always supported a two-state solution to the Israeli-Palestinian conflict. – Editor's Note.
[31] Indicating Taiwan separately in this Paper does not imply recognition of its independent status. We consider Taiwan as a part of the People's Republic of China. – Editor's Note.

As it was mentioned previously, South Sudan has not signed the NPT so far since its independence in 2011, but it has never refused to accede to it in the future. Anyway, there are no nuclear weapons in South Sudan to make it very clear.

What is on the radar screen is the Middle East with Israel and South Asia with India, Pakistan, and the DPRK to a certain extent. India and Pakistan have never signed the NPT. Those two countries have always rejected the Treaty. Israel is believed to have a nuclear bomb, but the country has never admitted that it has nuclear weapons. At the same time it has never denied having them, pursuing the policy of *nuclear ambiguity*. The DPRK announced in 2003 that it would withdraw from the NPT and later, in 2006, conducted its first nuclear test. Speaking very practically, Russia does not consider the DPRK to be out of the NPT. It did not fully complete the procedures of withdrawal from the NPT. But the fact is that the DPRK has its own nuclear arsenal.

> ***"Each Party shall in exercising its national sovereignty have the right to withdraw from the Treaty if it decides that extraordinary events, related to the subject matter of this Treaty, have jeopardized the supreme interests of its country. It shall give notice of such withdrawal to all other parties to the Treaty and to the United Nations Security Council three months in advance. Such notice shall include a statement of the extraordinary events it regards as having jeopardized its supreme interest".***
>
> **Article X.1 of the NPT**
> **1968**
>
> *Source: https://disarmament.unoda.org/wmd/nuclear/npt/text/*

▶ *Pressure point №2 – Persistence of risks of nuclear proliferation by state parties of the NPT in non-compliance to Articles I and II of the Treaty*

Articles I and II of the NPT have been preventing state parties to the NPT from the temptation to obtain nuclear weapons. One of the significant concerns is the risk of nuclear sharing by the *haves*. The United States does share knowledge with its NATO allies, particularly during their drills in Europe with aircrafts and bombers that involve the potential use of the US' nuclear munitions deployed in Europe.

It is also true that one should be very watchful about those nations of the world that are parties to the NPT but have their own advanced nuclear program. Again, there is nothing wrong with the fact that they develop nuclear energy or have strong interest in that. This is promoted by the Treaty. One should be very careful to avoid a situation when country X, developing its nuclear fuel cycle, for some reasons decides to switch its advanced peaceful nuclear program into a non-peaceful one by taking such a political decision.

At least nine nations of the world can be considered *threshold states*[32]: Japan, the Republic of Korea, Taiwan, Ukraine, Türkiye, Egypt, Saudia Arabia, Iran, and Brazil. This list is not necessarily limited to nine because one can add Poland, the UAE, Australia, etc. So, in general, there are threshold states: there are states with advanced nuclear programs, there are states that may advance their nuclear programs pretty quickly or build alliances based on nuclear sharing.

[32] Find more: Новая ядерная девятка? Оценка угроз распространения ядерного оружия в мире. Доклад. Издание 2-е (исправленное и дополненное) / Ред. В.А. Орлов, С.Д. Семенов. М.: ПИР-Пресс, 2023. – 230 с. – (ПИР-Библиотека - книжная серия).

▶ *Pressure point №3 – General provisions of the Article VI of the NPT, or the importance of working on nuclear disarmament, on the cessation of the nuclear arms race and the interconnection between nuclear and other types of weapons*

The noble goal of humankind should be a general and complete disarmament treaty which would be the real address to those who are concerned about a holistic response to this issue of nuclear disarmament. It is clear that progress with reducing the numbers of nuclear weapons is unsatisfactory. There is only one very efficient agreement – 2010 New START –, but it was not as sustainable as one would like it to be, and it is going to expire in 2026. Currently, there is no sign that there will be a new treaty ready to be a substitute for the New START after that year. The strategic arms control dialogue between Russia and the US has been frozen for the last years but it is obvious that the whole work on nuclear disarmament cannot be done only by those two nations.

▶ *Pressure point №4 – Politicization of nuclear proliferation, disarmament, peaceful uses of nuclear energy and arms control*

One example can be made to illustrate that this is a big problem that unfolded 20 years ago. Saddam Hussein's Iraq was working on nuclear weapons in the 1980s. In the early 1990s, the international community, including the Soviet Union, worked together to put the Iraqi nuclear ambitions under control after the First Gulf War (1990-1991). IAEA inspectors came to Iraq. There were commissions built to control other weapons of mass destruction (WMD) programs and delivery systems in Iraq. Coming back to nuclear weapons, on the one hand, the inspectors were surprised with the advanced level of Iraq's nuclear weapons program. On the other hand, they managed to destroy Iraq's nuclear weapons program and to bring its capabilities back to zero.

> *"Remember discussing the real threat of nuclear proliferation in Iraq with the Americans in 2003. American experts, not politicians, were quite professional and they knew that there was nothing there, but they were instructed by the White House to provide a proof of Iraq working on nuclear weapons. They had to provide all those PowerPoint presentations at the UN Security Council, all the other fakes, which were good to sell to the international audience and the US domestic audience. Many years after the invasion they had to report that there were no weapons of mass destruction in Iraq, but the troops were already there. Housewives watching the TV were still under the impression that those bad guys in Iraq were so bad because they were developing nuclear weapons. Americans under George W. Bush (2001-2009) used the We Will Fight Proliferation slogan when they intervened Iraq, and that was completely wrong because they basically provided disinformation, finding it easier to sell their aggression under the sign of nonproliferation or counterproliferation".*
>
> **Vladimir Orlov**

▶ *Pressure point №5 – Attempts to solve nuclear nonproliferation issues outside the boundaries of the existing international legal framework*

There may be concerns about the intentions of this or that country. You do not like that country, you have bad relations with that country, but instead of using the tools and the instruments which are legally binding, i.e., the UN Security Council or the IAEA, you just make your own conclusion and then start imposing economic sanctions, intercepting the

ships of that country. You apply a lot of political pressure trying to demonize that country, to blame it, to describe it as a bad player in international relations. Some things that are worse than that happen as well, i.e., the assassinations of nuclear scientists, which Iran has experienced. That is the general logic of this problem.

The Israelis, who themselves are considered to have nuclear weapons, believe that it is against their interests to have other nuclear nations in the Middle East. They are extremely active in doing the immediate counterproliferation. They already bombed a reactor in Iraq in 1981 and a nuclear facility in Syria in 2007. It is too difficult to destroy the Iranian nuclear cycle. Together with the Americans, the Israelis used cyberattacks, *Stuxnet* or the *Olympic Games* Operation, and directly killed nuclear scientists and engineers key to the Iranian advanced peaceful nuclear program.

▶ *Pressure point № 6 – The risks of nuclear terrorism*

This threat should not be overexaggerated. While the risk may be low, the consequences, if violent non-state actors, terrorists get access to nuclear munitions or fissile materials, will be very noticeable for some countries, for some regions, and perhaps for the whole world. What are the faces of nuclear terrorism?

Number one is sabotage at nuclear facilities. This is not impossible, especially if a terrorist organization has support within the nuclear facility. The second face is unauthorized access to weapons-grade materials. This face of nuclear terrorism has a low probability, but noticeable consequences. Number three is nuclear munitions the risk of which is very low. The physical protection of nuclear munitions is well established in most states.

In the 1990s, Russia experienced quite a number of cases of nuclear terrorism from Chechen separatists, putting radioactive materials in Izmaylovo Park in Moscow and trying to get an access to the train tracks with nuclear munitions during the process of their dismantlement. This is a situation where nuclear disarmament could unfortunately play in favor of those terrorist groups. Moreover, they had strong interest in getting access to Russian nuclear *closed cities*. Being in economic distress and social crisis, Russia put a lot of effort into preventing terrorists from getting access to nuclear munitions. With international support throughout the 1990s and early 2000s, Russia managed to remove that risk and the issue of illicit trafficking.

Osama bin Laden[33] was hoping to get nukes from the Russian Ural. Very soon he was advised that it would be unrealistic, impractical, and he turned to the much cheaper option of using the airplanes, and we still remember what 9/11 was like for New York and Washington and for the rest of the world.

Terrorists analyze what is more realistic for them. Sometimes what they want is not the effect of devastation, but global attention. The word *nuclear* on TV channels, front pages of newspapers, Internet browsers, etc. still works to attract attention. It is better to sell news with the word *nuclear*, which does not serves the purpose of nuclear nonproliferation.

[33] Osama bin Laden was a militant, a terrorist and founder of Al-Qaeda, this organization is recognized as terrorist in the Russian Federation. – Editor's Note.

▶ *Pressure point №7 – Stalling of the NPT review process*

In 1995, the NPT was extended indefinitely, but state parties still meet every five years to review the Treaty. In the current global situation, achieving a real consensus within the NPT review process is probably close to unrealistic.

The two recent NPT review conferences held in 2015 and in 2022 ended without final documents. In 2015, it was explained by the lack of the progress in establishing a zone free of nuclear weapons and other weapons of mass destruction in the Middle East (MEWMDFZ). Also, there were many demands, and requirements by the *have-nots* for more reporting by the nuclear-weapon states on their arsenals. Moscow thought that we could accept that. The problem was with the US, Canada, and the UK that chose to ignore the will of the majority to make more effort related to the Middle East zone free of nuclear and other weapons of mass destruction. At the 2022 NPT Review Conference, the *collective West* led by the US, the UK and France, supported by a number of other NATO members, decided to diplomatically attack Russia with accusations and provocations that had nothing to do with reality and nothing to do with the Treaty. The Russian position was not taken into consideration. That was why Russia did not support the final draft document.

REGIONAL PRESSURE POINTS

Those days nuclear nonproliferation is not far from the attention of Russian decision makers. Why? Most of the regional tensions, involving nuclear issues, are *located* along the perimeter of Russia's borders. For Russia preventing proliferation and avoiding the introduction of the nuclear factor in regional conflicts is a part of its foreign and security policy.

▶ *The situation in the Middle East*

The Middle East calls for the establishment of a zone free of nuclear weapons and other weapons of mass destruction in the region. It has a long history starting in the 1950s. But it was in May 1995, at the NPT Review and Extension Conference, when that call was put on paper as a decision on the Middle East adopted by the Conference. Not much happened after that.

There is at least one nation with nuclear weapons in the Middle East, and this is Israel. Israel has the legitimate right not to be a party to the NPT. However, Israel participates in the NPT review conferences as an observer. Being the only country in the Middle East with nuclear weapons, it destabilizes the whole region when nuclear issues are concerned. Not Iran, but Israel may be the primary source of a nuclear chain reaction in the Middle East. By ignoring the calls for such a treaty on a MEWMDFZ, by not participating in conferences which are now held on a regular basis in New York, Israel certainly does not behave wisely. Tactically, it can be understood why Israel does not want to be involved in this negotiation process. Strategically, it is not a solution.

One should not forget that the US nuclear weapons are located on Turkish soil. Türkiye does not control those nuclear weapons, but there are other players in or next to the region with nuclear weapons on their soil. There are other states in the region that histor-

ically cheated and, while being within the NPT, they developed their clandestine nuclear military programs. These are Iraq, Syria, Libya. There are nations that have great interest in nuclear energy, such as Türkiye, Egypt, Saudi Arabia.

> *My teacher Ambassador Roland Timerbaev told me that for Israel the only solution related to nuclear weapons will be to repeat what South Africa once did in early 1990s, probably without any transparency, but to destroy its nuclear arsenal one day and then to join the nuclear have-nots club. Clearly the situation in the region demonstrates that we are very far from that scenario".*
>
> **Vladimir Orlov**

The nuclear problems of the Middle East also involve also chemical and biological weapons issues. Until relatively recently, Syria had a chemical arsenal and declared that the arsenal was its security needed to counterbalance Israeli nuclear weapons. With the active participation of Russia, in 2014, Syria agreed to destroy its chemical arsenal and to join the Chemical Weapons Convention (CWC). But that example was not followed by others.

▶ *The situation in East Asia*

The North Korea was watching the nuclear developments in the world very closely. Its leaders noticed that they were on the list of the *Axis of Evil* developed by the US administration. They noticed what happened to Saddam Hussein. They noticed what happened to Colonel Gaddafi, who was playing with the nuclear weapons idea or exchanging his nuclear weapons program for recognition of himself by the Western leaders.

> *Do not demonize those who you do not understand. Try to understand why, for what security needs, or for what other needs they develop their nuclear weapons program. Then you will realize that the problem lies in the whole East Asia and not only in the part of the region".*
>
> **Vladimir Orlov**

Technologically Japan would probably need just a few months, if not a few weeks, to switch from its peaceful nuclear program to a non-peaceful one if such a political decision was made. At the same time, it is true that, being the victim of nuclear weapons, Japan would hesitate to turn to the military nuclear option. It is also true that Japan is under the US nuclear umbrella, and it has to follow the US' endorsed Constitution, which prohibits Japan from developing nuclear weapons. At some point, Japanese leadership may think differently than today.

Until the early 1990s there were nuclear weapons in South Korea. True, they were owned by the US and the US decided to withdraw them at some point. Of course, the North remembers that part of the story as well. It is also true that there were attempts by South Korean dictators to develop their own nuclear weapons program in the past.

The special case is Taiwan. Nowadays Taiwan indicates no interest in nuclear weapons. But historically there were times when Taiwan was looking into going nuclear, keeping in mind the intentions of the People's Republic of China vis-a-vis Taiwan.

▶ *The situation in South Asia*

Since 1968 India and Pakistan have been outside of the international nuclear nonproliferation regime, and since 1998 they both have nuclear weapons. It is not that important which of them has more nuclear weapons. The most important problem is that a regional rivalry between the two states still exists.

Pakistan has developed its nuclear weapons because of India. But India concentrates more on the Chinese nuclear arsenal. One cannot explain why China is a *have* and India should be a *have-not*, just because India *jumped on the nuclear weapons train* slightly later than China did in 1964. Getting rid of India's nuclear weapons would be possible when China does the same. Pakistan looks at India in this very unusual triangle.

▶ *The special case of Iran*

In 2015, the Joint Comprehensive Plan of Action (JCPOA) was signed. It was rather difficult to negotiate an Iranian nuclear deal. The JCPOA was a real compromise between parties involved in the negotiation process. Besides, it could make Iran's advanced nuclear program more transparent, put it under control, and also meet the concerns and needs of Iran.

Very unfortunately, in 2018, US President Donald Trump (2017-2021) decided to withdraw from the agreement. At this point, although there have been some attempts to restore the letter and spirit of the JCPOA, there has been no success.

Iranians are very disappointed about the failure of the JCPOA. Moscow is disappointed as well. Russia has nothing against Iran and the US achieving a new compromise that would serve their own interests and, what is important for Moscow, the interests of the global nuclear nonproliferation regime. It is a big question whether informal promises can be kept, but it is more worrisome that each new US administration comes with a new policy towards Iran which knows itself that trusting the US is completely impossible.

CONCLUSION

The list of nuclear nonproliferation pressure points can be continued. Suffice it to say, the NPT will survive, but the list of problems associated with nuclear nonproliferation will be expanded as well. There are still a lot of things to address, to analyze, and, hopefully, to fix.

UNIT II.
NUCLEAR NONPROLIFERATION AS THE FIRST PILLAR OF THE NPT

PAPER 7 .

NUCLEAR-WEAPON-FREE ZONES AS AN INSTRUMENT OF NUCLEAR NONPROLIFERATION REGIME

Daria Pakhomova

Nuclear weapons nonproliferation encompasses a complex of elements. One of them are nuclear-weapon-free zones (NWFZs). Nuclear-weapon-free zones are a unique phenomenon in the nonproliferation and security architecture. Their existence itself is a proof of peoples' and states' understanding of the danger nuclear weapons dissemination possess. Moreover, NWFZs are a tangible contribution to achieving nuclear disarmament, one of the fundamental objectives of the Nuclear Nonproliferation Treaty (NPT).

EVOLUTION OF A GENERAL CONCEPT

The first idea to establish a NWFZ was expressed by the Soviet Union in 1956. At the time, Moscow advocated for prohibiting the deployment of nuclear or hydrogen weapons in Europe. The initiative was further developed by Poland. In 1957, the Minister of Foreign Affairs of Poland Adam Rapacki put forward a plan to declare Central Europe a denuclearized zone. The two ideas – the Soviet Union and the Polish ones – combined aspirations to make Europe a less politically tense region, curb the US presence as well as prevent West Germany from acquiring nuclear weapons.

However, at the time Washington was reluctant to agree to any potential restrictions on the US presence in Europe whatsoever. Moscow's initiatives were perceived through the prism of the Cold War, so the zone could not be established.

Nevertheless, the notion of making entire regions of the world nuclear-weapons-free gained traction. In the 1960s, a number of initiatives was put forward concerning the Balkans and the Adriatic Sea, the Mediterranean Sea, the Baltic Sea, the North Europe, the Middle East, the Far East and so on. Yet, for political reasons the first NWFZs covered unpopulated and remote areas. Their legal framework comprises the following treaties:

- The Antarctic Treaty (opened for signature in 1959, entered into force in 1961) demilitarized the zone starting from 60 degrees South latitude.
- The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (open for signature and entered into force in 1967), or Outer Space Treaty (OST). The document banned weapons of mass destruction (WMD) deployment in outer space, the Moon and other celestial bodies were demilitarized too. Moon Agreement of 1979 elaborated the Outer Space Treaty provisions.

Then, 1971 was marked by opening for signature the Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Sea-Bed and the Ocean Floor and in the Subsoil thereof, or Seabed Treaty (entered into force in 1972). The document made impossible to deploy WMD out of states' territorial waters.

> ***Nothing in this Treaty affects the right of any group of States to conclude regional treaties in order to assure the total absence of nuclear weapons in their respective territories".***
>
> **Article VII of the NPT**
>
> **1968**
>
> *Source: https://disarmament.unoda.org/wmd/nuclear/npt/text/*

In 1975, the UN General Assembly Resolution № 3472 B defined a nuclear-weapon-free zone as: "...any zone recognized as such by the General Assembly of the United Nations, which any group of States, in the free exercises of their sovereignty, has established by virtue of a treaty or convention whereby:

(a) The statute of total absence of nuclear weapons to which the zone shall be subject, including the procedure for the delimitation of the zone, is defined;
(b) An international system of verification and control is established to guarantee compliance with the obligations deriving from that statute"[34].

"5. The conviction that the establishment of internationally recognized nuclear-weapon-free zones, on the basis of arrangements freely arrived at among the States of the region concerned, enhances global and regional peace and security is reaffirmed.

6. The development of nuclear-weapon-free zones, especially in regions of tension, such as in the Middle East, as well as the establishment of zones free of all weapons of mass destruction, should be encouraged as a matter of priority, taking into account the specific characteristics of each region. The establishment of additional nuclear-weapon-free zones by the time of the Review Conference in the year 2000 would be welcome.

7. The cooperation of all the nuclear-weapon States and their respect and support for the relevant protocols is necessary for the maximum effectiveness of such nuclear-weapon-free zones and the relevant protocols".

Principles and Objectives for Nuclear Non-Proliferation and Disarmament
1995

Source: https://disarmament.unoda.org/wmd/nuclear/npt1995/

These principles were reaffirmed by the 1999 UN Disarmament Commission Report, which offered additional recommendations on the establishment of a nuclear-weapon-free zone.

To sum up, a NWFZ should meet the several criteria. Firstly, the initiative to establish a NWFZ should emanate from the states of a respective region. Secondly, the zone should be recognized as such by the UN GA. Thirdly, it should be implemented through a legally

[34] Comprehensive study of the question of nuclear-weapon-free zones in all its aspects / UN General Assembly Resolution 3472, 1975 // United Nations.

binding instrument, have clear limits and enjoy a verification system. Finally, a NWFZ is impossible without the acquiescence of nuclear powers that would have to abide by certain limitations arising from relevant protocols.

"21. The initiative to establish a nuclear-weapon-free zone should emanate exclusively from States within the region concerned and be pursued by all the States of that region.

<...>

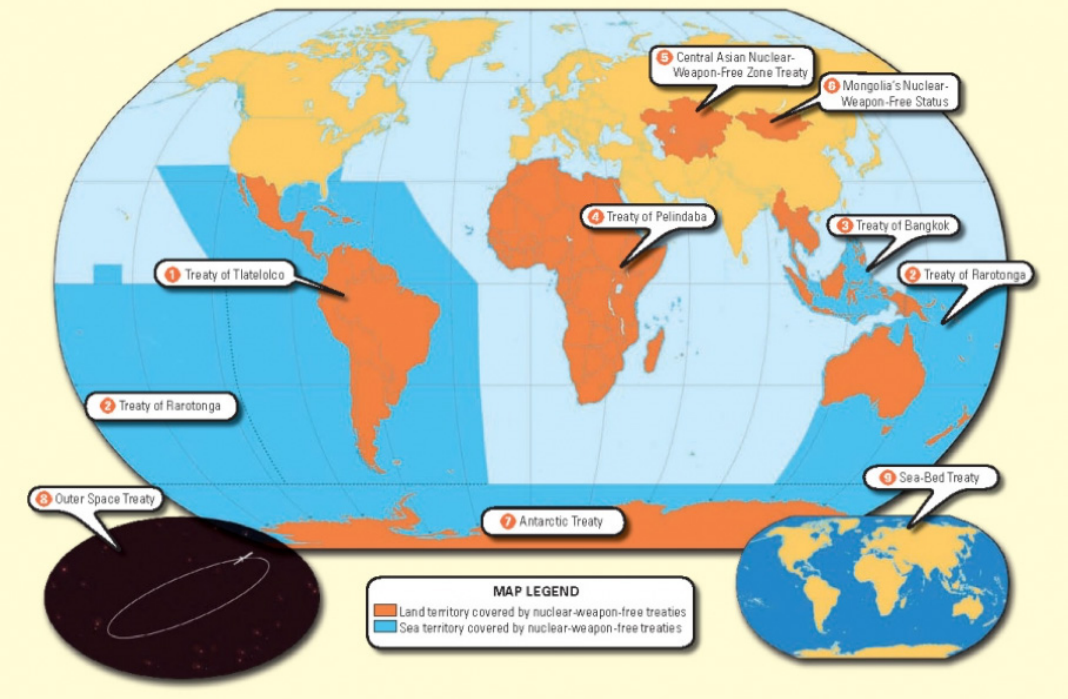
25. The nuclear-weapon States should be consulted during the negotiations of each treaty and its relevant protocol(s) establishing a nuclear-weapon-free zone in order to facilitate their signature to and ratification of the relevant protocol(s) to the treaty, through which they undertake legally binding commitments to the status of the zone and not to use or threaten to use nuclear weapons against States parties to the treaty.

<...>

37. A nuclear-weapon-free zone should not prevent the use of nuclear science and technology for peaceful purposes and could also promote, if provided for in the treaties establishing such zones, bilateral, regional and international cooperation for the peaceful use of nuclear energy in the zone, in support of socio-economic, scientific and technological development of the States parties".

Report of the Disarmament Commission
General Assembly
Official Records
Fifty-fourth session
Supplement No. 42 (A/54/42)
1999

Source: https://disarmament.unoda.org/publications/library/disarmament-commission/



Nuclear-weapon-free areas

Source: https://www.un.org/nwfz/content/overview-nuclear-weapon-free-zones

REGIONAL NWFZS

▶ *1967 Treaty of Tlatelolco*

The first NWFZ to be established in a populated area of the world was in Latin America under the Treaty for the Prohibition of Nuclear Weapons in Latin America and the Caribbean, or the Treaty of Tlatelolco.

The idea of making Latin America a NWFZ was voiced in 1958 by Costa-Rica, the objective being to encourage Latin American states to refrain from nuclear weapons production and acquisition of such weapons from the countries in possession of them. The idea did not gain much traction at the time. Yet, following the adoption of the UN GA Resolution № 1652 (XVI) *Consideration of Africa as a Denuclearized Zone*[35] Brazil proposed to extend its provisions to Latin America. In the wake of the 1962 Cuban Missile Crisis a group of regional states including Bolivia, Chile, Ecuador, Mexico endorsed the initiative.

The motion culminated with the Treaty of Tlatelolco being opened for signature on February 14, 1967, in Mexico City. Its unofficial name refers to the area of Mexico City where the Mexican Foreign Ministry is located.

State parties to the Treaty of Tlatelolco: Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay, Venezuela.

One of the peculiarities of the Treaty is the provisions concerning its entry into force (Article 28). The text requires entry into force for the whole region, so all the state parties have to sign and ratify the Treaty itself. Besides, there are Additional Protocol I and Additional Protocol II which are to be ratified by certain non-regional states (Protocol I for the USA, United Kingdom, France, and the Netherlands; Protocol II for five nuclear-weapon-states – they all joined the document with reservations). Finally, safeguards agreements with the International Atomic Energy Agency (IAEA) were to be sealed.

> ***"All signatory States shall have the imprescriptible right to waive, wholly or in part, the requirements laid down in the preceding paragraph. They may do so by means of a declaration which shall be annexed to their respective instrument of ratification and which may be formulated at the time of deposit of the instrument or subsequently. For those States which exercise this right, this Treaty shall enter into force upon deposit of the declaration, or as soon as those requirements have been met which have not been expressly waived".***
>
> **Article 28. 2 of the Treaty of Tlatelolco**
>
> **1967**
>
> Source: https://treaties.unoda.org/t/tlatelolco

[35] Consideration of Africa as a denuclearized zone // United Nations Digital Library.

In 1969, the Treaty was in force for 11 Latin American states. By 1990 there were 23 states, in 1999 the number of signatory states was as high as 32. Now all 33 countries of Latin America and the Caribbean are parties to the Treaty of Tlatelolco, with Cuba having ratified the Treaty in 2002.

The implementation body under the Treaty is the Agency for the Prohibition of Nuclear Weapons in Latin America (OPANAL). It is responsible for holding meetings among member states related to the purposes, provisions and procedures established by the Treaty. The Treaty of Tlatelolco establishes the General Conference, the Council and the Secretariat as principal organs of OPANAL. By provision of Article 7 of the Treaty of Tlatelolco, OPANAL headquarters is located in Mexico City. The General Conference is the supreme organ of OPANAL, and it is composed of all the contracting parties, namely, all the 33 Latin America and the Caribbean countries. It holds regular meetings every two years and may also hold special sessions whenever the Treaty of Tlatelolco so provides or, in the opinion of the Council, the circumstances so require.

It is curious to note that the Treaty of Tlatelolco was amended three times. The first amendment in 1990 was actually about adding the Caribbean to the title. The second amendment introduced in 1991 regarded states' adherence to the Treaty. Originally, if a state had an unsettled territorial dispute, it was unable to join the Treaty according to the Article 25.2. The 1991 amendment lifted this restriction. The amendment introduced in 1991 allowed Belize and Guyana to adhere to the Treaty. The third amendment regarded Articles 14, 15, 16, 19, 20. The essence was to grant the IAEA the exclusive right to conduct inspections. Previously, OPANAL had such authority, too. However, the amendments are, too, to be not only signed, but also ratified by the state parties. Only 16 states have fully complied with the condition so far.

The global significance of the Treaty of Tlatelolco is that it set the relevant precedent for the establishment of other NWFZ. It was not an easy task for those who drafted the Treaty, as they had no model or example in 1967 even the NPT did not exist at that times.

▶ *1985 Treaty of Rarotonga*

The South Pacific Nuclear Free Zone Treaty, or Treaty of Rarotonga, was opened for signature in August 1985 and entered into force in December 1986. It was the second NWFZ to enter into force in a populated region following the Treaty of Tlatelolco in Latin America.

The Treaty was *inspired* by the South Pacific's experience with nuclear weapons testing. Three nuclear-weapon states (the United States, the United Kingdom and France) carried out a significant number of nuclear tests in the South Pacific. The US tested its nuclear weapons in Polynesia and in the Marshall Islands – the most famous test site is the Bikini atoll. The US conducted 102 test explosions. The United Kingdom used other atolls of the Marshall Islands to carry out 21 explosions. Finally, France conducted 193 explosions in the Mururoa and Fangataufa atolls, inhabited coral islands far in the ocean.

The initiative to establish a NWFZ in the region belongs to Australia which put it forward in 1983. 1985 saw 13 states of the South Pacific to sign the Treaty of Rarotonga, owing its name to one of the atolls of the Cook Islands.

The Treaty provides that it is open for signature by states that are members of the South Pacific Forum (the Pacific Islands Forum, PIF, – renamed in 2000). The PIF Secretary General is the depository for the Treaty of Rarotonga and provides regular updates to member states. Afterwards the right to adhere to the Treaty was granted to other three states: the Marshall Islands, Micronesia and Palau, but they failed to exercise this right so far.

State parties to the Treaty of Rarotonga: Australia, Cook Islands, Fiji, Kiribati, Nauru, New Zealand, Niue, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu.

The Treaty of Rarotonga prohibits the manufacture, acquisition, possession, or control of nuclear explosive devices by its parties, as well as the dumping of radioactive wastes at sea within the defined zone. It also requires parties to the Treaty to prevent the testing or stationing of nuclear explosive devices within their territories.

> ***Article 5. PREVENTION OF STATIONING OF NUCLEAR EXPLOSIVE DEVICES***
> ***1. Each Party undertakes to prevent in its territory the stationing of any nuclear explosive device.***
> ***2. Each Party in the exercise of its sovereign rights remains free to decide for itself whether to allow visits by foreign ships and aircraft to its ports and airfields, transit of its airspace by foreign aircraft, and navigation by foreign ships in its terri torial sea or archipelagic waters in a manner not covered by the rights of innocent passage, archipelagic sea lane passage or transit passage of straits".***
>
> **Treaty of Rarotonga**
> **1985**
> *Source: https://treaties.un.org/doc/Publication/UNTS/Volume%201445/volume-1445-I-24592-English.pdf*

Article 5.2 contains provisions regarding transit of nuclear weapons. Each state remains free to decide on the issue. This is a novelty compared to the Treaty of Tlatelolco, which omitted the issue of transit and left space for discussions.

Given the region's experience there is Article 6 in the Treaty fully devoted to nuclear test ban. One more peculiarity, which again arises from the region's experience is prevention of dumping of radioactive wastes and other radioactive matter.

There are three Additional Protocols to the Treaty which were opened for signature on August 8, 1986. Protocol I was intended for the United States, France, and the United Kingdom. Each party to Protocol I undertakes to apply certain prohibitions under the Treaty to the territories situated within the zone for which it is internationally responsible. Protocol I prohibits the manufacture, stationing, or testing of nuclear explosive devices. This Protocol is in force for the UK and France, while the USA only signed it and failed to ratify it. This is the pattern the US used for Protocols II and III, the US signed but never ratified them.

Protocol II provides that the five nuclear-weapon states (China, France, UK, USA, and USSR/Russia) undertake not to use or threaten to use nuclear weapons against the par-

ties to the Treaty. Protocol III provides that the above five nuclear-weapon states would refrain from any nuclear testing within the zone. Protocols II and III are in force for China, Russia, UK, France – four nuclear-weapon states, except for the USA.

▶ *1995 Bangkok Treaty*

The Treaty on the Southeast Asia Nuclear Weapon-Free Zone, also known as the SEAN-WFZ Treaty or Treaty of Bangkok, was signed in December 1995 by ten South-East Asian states and entered into force in March 1997.

The Treaty of Bangkok is a step towards achieving the goals declared in the Zone of Peace, Freedom and Neutrality (ZOPFAN) Declaration signed in 1971 in Kuala Lumpur (also known as Kuala Lumpur Declaration). Moreover, the ASEAN Charter envisages to preserve South-East Asia as a zone free from all other weapons of mass destruction.

State parties to the Treaty of Bangkok: Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam.

The Treaty obliges states parties not to develop, manufacture or otherwise acquire, possess or have control over nuclear weapons, station or transport nuclear weapons, or test or use nuclear weapons. Interestingly, the South-East-Asian nations followed the example of the Treaty of Rarotonga by undertaking not to discharge radioactive material or wastes at sea, into the atmosphere or on land within the zone, and not to allow other states to conduct these acts. The provision on *radioactive material or wastes* is more comprehensive than in the Treaty of Rarotonga. The latter only bans dumping radioactive wastes at sea, while the Treaty of Bangkok says about atmosphere and land, too. The earlier experience is obviously taken into account.

The Treaty also has export control paragraphs, and advanced provisions concerning use of nuclear energy for peaceful purposes (Article 4). For instance, Article 4.2.(b) says that each state party undertakes "prior to embarking on its peaceful nuclear energy programme, to subject its programme to rigorous nuclear safety assessment conforming to guidelines and standards recommended by the IAEA"[36]. Moreover, "Each State Party shall conclude an agreement with the IAEA for the application of full scope safeguards to its peaceful nuclear activities not later than eighteen months after the entry into force for that State Party of this Treaty" (Article 5)[37]. The control system under the Treaty of Bangkok is more advanced if compared to the previous treaties on the NWFZs.

There is also a Protocol to the Treaty of Bangkok, however, nuclear-weapon states failed to ratify it. One of the reasons is Articles 1.(a) and 2.1 of the Treaty mention exclusive economic zones, thus expanding the zone of the Treaty's application. No sovereignty can be exercised in such zones, so these provisions seem to be really controversial, and there is no solution found.

[36] Treaty on the Southeast Asia Nuclear Weapon-Free Zone, 1995 // UN Office for Disarmament Affairs Treaties Database.
[37] Ibid.

> ***1. Each State Party undertakes not to, anywhere inside or outside the Zone:***
> ***(a) develop, manufacture or otherwise acquire, possess or have control over nuclear weapons;***
> ***(b) station or transport nuclear weapons by any means; or***
> ***(c) test or use nuclear weapons.***
>
> ***2. Each State Party also undertakes not to allow, in its territory, any other State to:***
> ***(a) develop, manufacture or otherwise acquire, possess or have control over nuclear weapons;***
> ***(b) station nuclear weapons; or***
> ***(c) test or use nuclear weapons.***
>
> ***3. Each State Party also undertakes not to:***
> ***(a) dump at sea or discharge into the atmosphere anywhere within the Zone any radioactive material or wastes;***
> ***(b) dispose radioactive material or wastes on land in the territory of or under the jurisdiction of other States except as stipulated in Paragraph 2 (e) of Article 4; or***
> ***(c) allow, within its territory, any other State to dump at sea or discharge into the atmosphere any radioactive material or wastes.***
>
> ***4. Each State Party undertakes not to:***
> ***(a) seek or receive any assistance in the commission of any act in violation of the provisions of Paragraphs 1, 2 and 3 of this Article; or***
> ***(b) take any action to assist or encourage the commission of any act in violation of the provisions of Paragraphs 1, 2 and 3 of this Article".***
>
> **Article 3 of the Treaty of Bangkok**
> **1995**
> *Source: https://treaties.unoda.org/t/bangkok*

▶ *1996 Treaty of Pelindaba*

The idea of establishing a NWFZ in Africa was enshrined in the UN GA Resolution № 1652 (XVI) *Consideration of Africa as a denuclearized zone* adopted in 1961. One more landmark on this long way was 1964, as this year Cairo Declaration on the denuclearization of Africa was adopted. However, it took more than three decades to elaborate a comprehensive treaty on the NWFZ in Africa and more than a decade to enforce it. Moreover, 1960s were a period of active nuclear testing in Africa, for example, France conducted such tests in Algeria.

The African Nuclear-Weapon-Free Zone Treaty, also known as the Treaty of Pelindaba, established the nuclear-weapon-free zone on the African continent. It was opened for signature in April 1996 in Cairo, Egypt, and entered into force in July 2009. The Treaty title refers to the South African town where the final text of the document was agreed in 1995. The experts had started to draft it in 1991.

Rendering the whole of Africa a NWFZ became possible thanks to the position of South Africa. Under the apartheid regime it pursued a nuclear weapons program, but

in 1990 the nuclear arsenal was eliminated, military nuclear facilities were closed, and South Africa even joined the NPT.

State parties to the Treaty of Pelindaba: Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cabo Verde, Chad, Comoros, Republic of Congo, Cote d'Ivoire, Democratic Republic of Congo, Equatorial Guinea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea Bissau, Kenya, Lesotho, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Seychelles, South Africa, Tanzania, Togo, Tunisia, Zambia, Zimbabwe.

The Treaty of Pelindaba is remarkable for its emphasis in the peaceful uses of nuclear energy. The Treaty requires all parties to apply full-scope IAEA safeguards to all their peaceful nuclear activities.

> ***1. Nothing in this Treaty shall be interpreted as to prevent the use of nuclear sciences and technology for peaceful purposes.***
> ***2. As part of their efforts to strengthen their security, stability and development, the Parties undertake to promote individually and collectively the use of nuclear science and technology for economic and social development. To this end they undertake to establish and strengthen mechanisms for cooperation at the bilateral, subregional and regional levels.***
> ***3. Parties are encouraged to make use of the programme of assistance available in IAEA and, in this connection, to strengthen cooperation under the African Regional Cooperation Agreement for Research, Training and Development Related to Nuclear Science and Technology (hereinafter referred to as AFRA)".***
>
> **Article 8 of the Treaty of Pelindaba**
> **1996**
> *Source: https://treaties.unoda.org/t/pelindaba*

Unlike the Treaty of Bangkok, the Treaty of Pelindaba does not cover areas beyond territorial waters of states parties.

Again, there are three Protocols to the Treaty. Protocol I regards use or threat to use nuclear weapons against any party to the Treaty or a territory within the zone. Only four of nuclear-weapon-states ratified it. The only nuclear-weapon state lagging behind is the US. Protocol II deals with nuclear testing. Ratification situation is the same, only the US failed to do this. Finally, Protocol III was opened for signature by France and Spain. France is a party to the document now, while Spain, which has two cities on the African continent (Ceuta and Melilla), did not even sign it.

▶ *2006 Semipalatinsk Treaty*

The Central Asian Nuclear-Weapon-Free Zone (CANWFZ) treaty was signed in September 2006 in Kazakhstan (the Treaty's another title is Semipalatinsk Treaty referring to the former nuclear test site of the USSR in Kazakhstan). The Treaty was ratified by all five Central Asian states and entered into force in 2009. The zone is the only one, among ex-

isting zones, situated entirely in the Northern Hemisphere, in a region directly bordering two nuclear-weapon states: Russia and China.

State parties to the Semipalatinsk Treaty: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan.

The Treaty prohibits for the Central Asian states to manufacture, acquire, test, or possess nuclear weapons.

> ***1. Each Party undertakes:***
> ***(a) Not to conduct research on, develop, manufacture, stockpile or otherwise acquire, possess or have control over any nuclear weapon or other nuclear explosive device by any means anywhere;***
> ***(b) Not to seek or receive any assistance in research on, development, manufacture, stockpiling, acquisition, possession or obtaining control over any nuclear weapon or other nuclear explosive device;***
> ***(c) Not to take any action to assist or encourage the conduct of research on, development, manufacture, stockpiling, acquisition or possession of any nuclear weapon or other nuclear explosive device;***
> ***(d) Not to allow in its territory:***
> ***(i) The production, acquisition, stationing, storage or use, of any nuclear weapon or other nuclear explosive device;***
> ***(ii) The receipt, storage, stockpiling, installation or other form of possession of or control over any nuclear weapon or other nuclear explosive device;***
> ***(iii) Any actions, by anyone, to assist or encourage the development, production, stockpiling, acquisition, possession of or control over any nuclear weapon or other nuclear explosive device.***
>
> ***2. Each Party undertakes not to allow the disposal in its territory of radioactive waste of other States".***
>
> **Article 3 of the Semipalatinsk Treaty**
> **2006**
> *Source: https://treaties.unoda.org/t/canwfz*

Given the long-lasting difficulties with the Caspian Sea status, the question may arise on the territorial waters, as Article 1 of the Treaty essentially equals the zone to the five states parties. The transit provision in Article 4 is similar to the one in the Treaty of Rarotonga: "Without prejudice to the purposes and objectives of this Treaty, each Party, in the exercise of its sovereign rights, is free to resolve issues related to transit through its territory by air, land or water, including visits by foreign ships to its ports and landing of foreign aircraft at its airfields"[38].

The Treaty has the only one Protocol. The first one was drafted along with the Treaty of Semipalatinsk, however, only Russia and China ratified it. Then negotiations followed to elaborate a new Protocol which was opened for signature by nuclear-weapon states in

[38] Treaty on a Nuclear-Weapon-Free Zone in Central Asia, 2006 // UN Office for Disarmament Affairs Treaties Database.

2014. Again, the US remains the only one nuclear-weapon state to have failed to ratify the Protocol so far. In general, the Protocol provides the participants of the zone with security assurances from nuclear-weapon states and prohibits for them to use or threaten to use a nuclear weapon or other nuclear explosive device against any party to the Treaty.

WMD-FREE ZONE IN THE MIDDLE EAST

The Middle East has always been full of turbulence and overlapping interests of regional and global powers. The establishment of a NWFZ there would have contributed greatly to the global security and stability. At the same time, the issue turned out to be among the most difficult ones for the countries to decide on.

"Just as some European NATO member states are being forced to accept US nuclear weapons and missiles, there is an attempt to do the same in the Middle East by the means of the Baghdad Pact. In seeking to create military bases with nuclear and missile weapons in these countries, the United States clearly want to distance possible theatres of military operations from its own territory so that, if the aggressors manage to plunge the world into the maelstrom of a new war, retaliatory strikes would fall primarily on others, including on the countries of the Baghdad Pact. Those who now seek to tie the Baghdad Pact to the NATO military machine, and are hypocritically exploiting religious motives, do not even want to reckon with the fact that the construction of military bases and the deployment of nuclear weapons and missiles in the Middle East, near holy places for all Muslims, represents an insult to the religious feelings of Muslims. One could imagine such a situation where next to the shrines in Mecca and Medina, revered by Muslims in all of the Middle East, warehouses of American atomic and hydrogen bombs will be located, and American bombers with nuclear bombs will fly over these territories, so that it becomes clear how little there is in common between the interests of the Muslim world and the military and strategic plans of the Pentagon.

<...>

The Near and Middle East should and can become a zone of peace, where there are no, and should not be, nuclear weapons and missiles, a zone of good neighborliness and friendly cooperation between states. The organizers of the Baghdad bloc are trying to prevent this, as indicated during a session of the Council of the Baghdad Pact in Ankara. In connection with the above, the leadership of the Soviet Union considers it necessary to draw the attention of the governments of countries participating in the Baghdad Pact to the fact that all responsibility for such a policy and the consequences arising from it falls on the US government, as well as on the leadership of those countries participating in this bloc that follow the policy of foreign imperialists".

Izvestia Newspaper
January 22, 1958

Source: https://app.unidir.org/sites/default/files/2021-01/1958%20Soviet%20Proposal.pdf

The first idea to establish a nuclear-weapon-free zone in the Middle East was put forward by the USSR in 1958. Then, the Soviet government called for the Middle and Near East to become a zone of peace free from nuclear and missile weapons, a zone of good

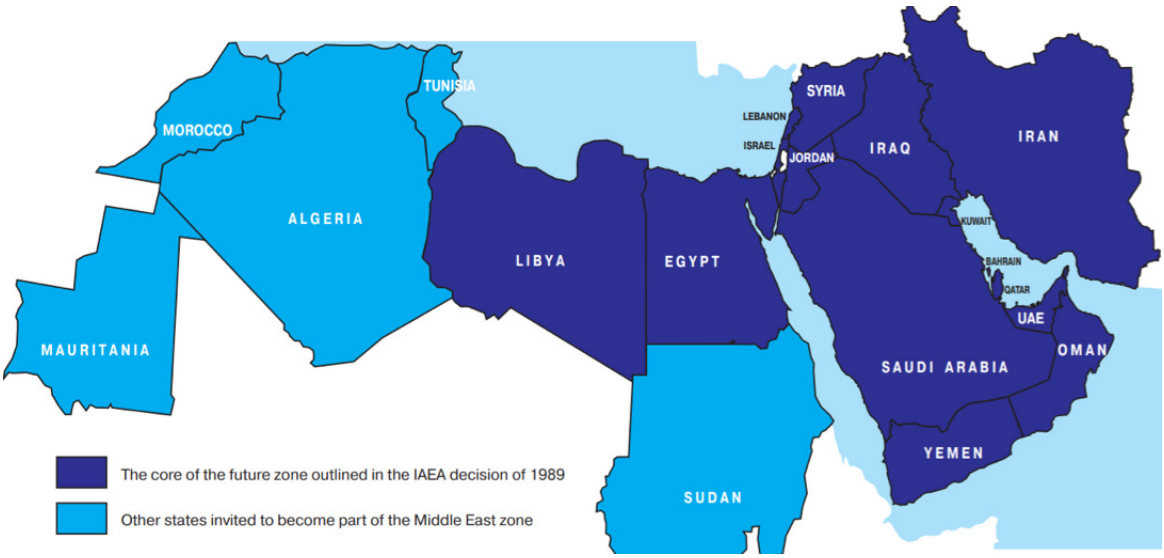
neighborliness and friendly cooperation between states[39]. However, at that time it was not duly supported by other countries. The US was the most prominent opponent believing the initiative was aimed at weakening the US capabilities and reducing its influence in the region.

16 years later in 1974, during the 29th session of the UN GA, Iran and Egypt co-sponsored the Resolution № 3263 calling for the establishment of a NWFZ in the Middle East. It also called on the states to adhere to the NPT. The resolution enjoyed wide regional support: there was no state to have voted against the resolution, with only two abstainers: Israel and Burma (Myanmar). The adopted Resolution № 3263 was also endorsed by the League of Arab States. The same call was repeated in the final document of the UN GA Special Session on Disarmament in 1978.

1980 saw the resolution *Establishment of a Nuclear-weapon-free zone in the region of the Middle East* adopted without a vote. The resolution called on all states in the Middle East to adhere to the NPT, place all their nuclear activities under the IAEA safeguards, and declare that they will not produce, test, acquire, or station nuclear weapons on their territory until a nuclear-weapon-free zone in the Middle East is established[40]. Israel introduced its own project but decided to withdraw it so as not to ruin the consensus. In 1981, Israel even proposed to convene a conference on the NWFZ establishment.

During the 1985 NPT Review Conference, the USSR noted that the time was ripe to practically implement the NWFZ in the Middle East. The first step should have been refraining from deployment of nuclear weapons in the states of the region. Nevertheless, the topic still was not at the top of the agenda.

However, the 1980s saw increased nuclear activities by Israel. The IAEA resolution co-sponsored by Algeria, Iraq, the Islamic Republic of Iran, Jordan, Kuwait, Lebanon,



IAEA decision of 1989 outlined the borders of the future Middle East zone

Source: https://pircenter.org/wp-content/uploads/2022/10/WDFZ-White-Paper-2013-EN.pdf

[39] 1958 Soviet Proposal for the creation of a Middle East Nuclear Weapons Free Zone // UNIDIR.
[40] Establishment of a Nuclear-weapon-free zone in the region of the Middle East, 1980 // UNIDIR.

Madagascar, Morocco, Namibia, Saudi Arabia, Sudan, the Syrian Arab Republic, Tunisia and the United Arab Emirates – was first introduced under the title *Israeli nuclear threat* in 1986, but was defeated by a vote at the IAEA General Conference. The amended draft made a direct reference to recent information regarding the possession of nuclear weapons by Israel. The 1988 resolution entitled *Israel nuclear capability and threat* demanded that Israel place all its nuclear facilities under the IAEA safeguards in compliance with the UN Security Council Resolution № 487[41]. This marked the start of the long-lasting problem. Israel already seemed reluctant to further work on the NWFZ establishment.

Yet, the process was already launched. In 1989, the IAEA issued Technical Study on Different Modalities of Application of Safeguards in the Middle East. This document defined the region of the Middle East as extending from *the Libyan Arab Jamahiriya in the west, to the Islamic Republic of Iran in the east, and from Syria in the north to the People's Democratic Republic of Yemen in the south*[42]. It was very important as previously there was no definition of the region in the UN resolutions on the issue or in other documents.

Although there was not any considerable practical progress, many states remained enthusiastic about the issue. In April 1990, Egypt stepped forward with what was later called *Mubarak Initiative* after Egyptian President Hosni Mubarak who called on the Middle Eastern states to expand the concept of a nuclear-weapon-free zone in the Middle East to include all the weapons of mass destruction. Thus, the concept became more comprehensive, but practically there was not much of a shift in the zone implementation process.

Nevertheless, the problem of making the Middle East WMD-free received more attention. In 1991, the UN Security Council adopted Resolution № 687 which put an end to the First Persian Gulf War (1990-1991) and called for an NWFZ and a zone free of all WMD to be established.

Still, in 1994 the League of Arab States in its Resolution № 5380 established a high-level Technical Committee to draft a Middle East WMDFZ treaty. It included international law and military affairs experts to draft a treaty establishing a WMDFZ in the Middle East, as well as to formulate recommendations to be presenting during the 1995 NPT Review and Extension Conference. The process took a decade.

1995 turned out to be a landmark year in the process, as this was the year of the NPT Review and Extension Conference. The Treaty and its term of duration were in the center of attention and – fortunately – the main result of the event was making the NPT an agreement of unlimited duration. The League of Arab States raised the issue of the WMDFZ establishment. It drafted a resolution condemning Israel's refusal to join the NPT and demanding the establishment of the zone. Israel, however laid down the condition of long-lasting peace to be set before organizing the zone, as it considered some states, including Iran, Iraq and Libya hostile rivals.

The final document of the Conference contained both the NPT unlimited extension and the Resolution on the Middle East that called upon the states of the region to take practical steps at appropriate forums aimed at achieving the establishment of an effectively

[41] Israeli nuclear capabilities and threat / Resolution adopted during the 312th plenary meeting, on 23 September 1988 // IAEA.
[42] Technical Study on Different Modalities of Application of Safeguards in the Middle East, 1989 // UNIDIR.

verified WMD-free zone in the Middle East, as well as to join the NPT and to place all their nuclear facilities under comprehensive safeguards of the IAEA.

It is to be underlined here that the WMDFZ of the Middle East discussions were largely in line with the NPT review conferences and many landmark steps were made during the NPT-linked events.

The next NPT Review Conference took place in 2000. By that time Israel had remained the only state of the Middle East failing to join the NPT. The final document of this Conference underlined the importance of Israel joining the NPT and placement of its nuclear facilities under comprehensive safeguards of the IAEA.

The 2005 NPT Review Conference terminated failing to adopt a final document, with the MEWMDFZ being the central issue of the strife. Moreover, 2005 saw the competition between different approaches to the WMDFZ. The Gulf Cooperation Council (GCC) tried to advance its own initiative (the Gulf States essentially wanted to start the WMDFZ from their subregion), while the League of Arab States firmly opposed them.

The approaches among the nuclear-weapons-states also differed significantly. In 2009, Russia clearly expressed a comprehensive approach to the issue. It backed the idea of assigning a special coordinator to hold consultations on the MEWMDFZ and called on the regional states to elaborate confidence-building measures. Finally, Moscow highlighted the close interlinkage between the MEWMDFZ and the Middle East peace process (Russia has long been an intermediary within the Middle East peace process together with the UN, EU and USA).

Subsequently, the 2010 NPT Review Conference final document included the MEWMDFZ passage. It was envisaged to hold conference of the MEWMDFZ no later than 2012 and the appointment of a facilitator and host government. The League of Arab States decided to coordinate the efforts. The Council of Arab Ministers for Foreign Affairs adopted the Resolution № 7243 establishing a Senior Officials Committee which would report the League of Arab States Council of Arab Foreign Ministers on the preparation for the Arab participation in 2012 MEWMDFZ conference. The resolution also called for the coordination of the Arab position at the 54th IAEA General Conference.

The preparations went on amid the events of the Arab Spring which began in early 2010s: it was the wave of uprisings in the countries of the Middle East, some of which entailed radicalization or even transformed into civil wars. The most tragic example is Libya where the legitimate authorities were overthrown following a brutal humanitarian intervention by a Western coalition led by NATO. Syria, too, faced years of civil confrontation along with the war against terrorists of Islamic State of Iraq and Syria (ISIS)[43].

Syrian case is also very interesting to examine in the context of WMD elimination and international efforts joint to this end. The case of removal and elimination of Syria's chemical weapons arsenal is a vivid example of responsible behavior of most influential stakeholders in the nonproliferation field including Russia. Regrettably, *Syrian chemical dossier* later came to be politicized by the Western powers.

[43] The organization is recognized as terrorist in the Russian Federation. – Editor's Note.

The preparatory process, however encountered a lot of obstacles and it was finally decided to postpone the 2012 conference, with no new date being set. During the whole process it was always a topic of debate, whether to include the regional peace issues in the agenda or it should be a separate track. It was Israel that insisted to consider the issues in complex. Moreover, the United States were reluctant to put pressure on Israel to implement the decisions of the 2000 and 2010 NPT review conferences.

Arab states were dissatisfied with this decision to postpone the conference on the WMD-free zone in the Middle East. In April 2013, the Arab Group presented a working paper calling for organizing the conference in 2013. Then the work was a bit revived and the facilitator sent invitations to Israel, the League of Arab States Secretary General and the Chairperson of League of Arab States Senior Officials Committee to meet in Vienna in August 2013 to discuss details of the planned preparatory consultations for convening the postponed 2012 conference.

Interestingly, one of the problems was that the invitation had been received by the potential participants of the event on August 5, less than two weeks before the scheduled consultations and shortly after one of the major Islamic holidays. Beside these failures, there were substantial difficulties. In its response the League of Arab States underlined that they were surprised to find that Israel refused to participate with the conveners collectively during the meeting and Iran was not invited shedding doubts on the credibility of the entire process.

The meeting took place in October in Glion, Switzerland. Then other four rounds of talks in Switzerland followed in 2013-2014. However, the old problem again blocked everything: Israel still wanted to discuss regional security issues. The Arab states could not agree on that. So, the negotiations were deadlocked.

All participants in the talks to establish a WMD-free zone should make joint statements in which they commit themselves to refrain from attacks (including cyberattacks), or threats of attacks, against each other's declared nuclear facilities placed under IAEA safeguards.

Egypt has been one of the prominent advocates of the MEWMDFZ establishment, and a new step was made by this country at the 2015 NPT Review Conference. It suggested that a conference on the WMDFZ establishment should be held within 180 days after the 2015 NPT Review Conference ending. A large group of states supported Egypt, however, some Western countries – the US, UK and Canada – objected. The 2015 NPT Review Conference ended with no final document and no real progress on the MEWMDFZ.

In 2016-2018, a lot of various initiatives were put forward by Arab states, Russia and some groups of countries, but there was still a lot of work to do. In 2018, the Arab Group introduced a draft decision entitled *Convening a conference on the establishment of a Middle East zone free of nuclear weapons and other weapons of mass destruction*. The UN General Assembly voted in December 2018 with 103 votes in favor of the decision, 71 member states abstained and 3 against (Israel, Micronesia and the US).

Finally, Conference on the Establishment of a Middle East Zone Free of Nuclear Weapons and Other Weapons of Mass Destruction held its first session. A political declaration,

a decision on the presidency of the Conference, and the dates of future sessions were agreed. The countries not to attend the event were Israel and the US.

1) All participants in the talks to establish a WMD-free zone should make joint statements in which they commit themselves to refrain from attacks (including cyberattacks), or threats of attacks, against each other's declared nuclear facilities placed under IAEA safeguards.
2) As part of the negotiations, the participants should draw a road map for gradually placing all nuclear infrastructure facilities in the region under the IAEA safeguards.
3) During the talks, all the states in the region should reach an understanding on the need to ratify without any further delay the Additional Protocol to the IAEA Safeguards Agreement.
4) The process could be facilitated by a decision to form a standing regional mechanism for confidence-building measures with regard to nuclear programs, as well as chemical and biological weapons and some types of delivery systems.
5) Participation of all the Middle Eastern states in the Comprehensive Nuclear-Test-Ban Treaty should be a precondition for signing a treaty establishing a WMD-free zone in the region.
6) Delivery systems should not be at the top of the agenda of the talks on establishing the WMD-free zone. Nevertheless, signing agreements to ban certain types of missiles would help build confidence and establish verification mechanisms in the region.
7) The negotiations should lead to a decision to set up an intergovernmental commission to draft the text of the treaty establishing a WMD-free zone in the Middle East. This should be done with the understanding that during the work on the text of the treaty all countries in the region will join the Chemical Weapons Convention (CWC) and the Biological and Toxin Weapons Convention (BTWC). The treaty should also establish verification mechanisms.
8) Internationalizing the nuclear fuel cycle would strengthen international cooperation in the region and reduce the likelihood of some countries choosing to pursue nuclear weapons programs.
9) Institutional nuclear cooperation in the Middle East should be strengthened through the creation of a universal body which would include every country in the region.
10) The states of the Middle East which are on the verge of a rapid expansion of their nuclear infrastructure should establish reliable mechanisms for early warning in the event of a nuclear accident.

Ten steps towards establishing a WMD-free zone in the Middle East
PIR Center White Paper
2013

Source: https://pircenter.org/wp-content/uploads/2022/10/WDFZ-White-Paper-2013-EN.pdf

2020 added one more obstacle – due to the COVID-19 pandemic the second session of the Conference was postponed to 2021. It was convened late in 2021 in New York. Egypt, Russia and Syria provided working papers; the Organization for the Prohibition of Chem-

ical Weapons (OPWC) prepared a background document. A Report, a Decision on the Establishment of a Working Committee and the Rules of Procedure were adopted and soon afterwards several sessions of the Working Committee have been held.

CONCLUSION

To conclude, the NWFZs are on the one hand, a nonproliferation tool which is able to render large regions of the world more secure. On the other hand, given that a NWFZ establishment requires coordination and cooperation of the participating states, NWFZs can promote regional unity. However, as can be seen from the specific cases, there may be difficulties to overcome in the interaction with nuclear-weapon states, as some of them turn out to be reluctant to ratify or even sign the additional protocols to the NWFZs treaties seeking their own interest.

The long MEWMDFZ process shows that sometimes it is near to impossible to find a common ground, especially in areas lacking stability and regional cohesion. On-going deep-rooted conflicts, like the Israeli-Palestinian one, are a great impediment on the way, as sometimes it is even impossible to draft an agenda and make everyone gather at the negotiation table. One can only hope that there will be some progress in finding ways to establish a WMDFZ in the Middle East. However, the regional developments show that the WMDFZ establishment is not at the top of Middle Eastern agenda, as there are other urgent issues to be prioritized, like conflict settlement. ■

PAPER 8 .

INTERNATIONAL MECHANISMS OF EXPORT CONTROL

Igor Vishnevetsky and Elena Karnaukhova

An important role in accomplishing the strategic goal of preventing the proliferation of the weapons of mass destruction (WMD) and their delivery systems as well as the uncontrolled spreading of conventional armaments belongs to the international cooperation within the framework of multilateral export control mechanisms: the Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies (WA), Nuclear Suppliers Group (NSG), Zangger Committee (ZAC), Missile Technology Control Regime (MTCR), and the Australia Group (AG).

The above-mentioned regimes impose significant restrictions on the freedom of trade in advanced dual-use goods and technologies and help to maintain transparency in this sphere. They are not legally binding international treaties, but rather a set of political arrangements between owners and consumers of sophisticated technologies with both military and civilian applications. The rules forged out under these regimes apply, first and foremost, to the relations between their members. This is the reason why some scholars occasionally refer to them as *gentlemen's agreements*. But this would be an overly simplified conception of their essence and the seeming vagueness of their *mandates*. In practice, once the export control norms and control lists have been agreed in a multilateral fashion, the regime participants commit to incorporate them in their national laws to provide the supporting regulatory framework and ensure strict compliance.

FOOD FOR THOUGHT

The prototype of the modern export control architecture was Coordinating Committee for Multilateral Export Controls (CoCom). It was established in 1949 by Western countries to control export of strategic goods and technologies to the USSR and other socialist countries and to put an embargo on CoCom members in this regard.

CoCom included 17 countries: Australia, Belgium, Canada, Denmark, France, Greece, Italy, Japan, Luxembourg, the Netherlands, Norway, Portugal, Spain, Türkiye, the UK, the USA. Besides, it cooperated with Austria, Finland, Ireland, New Zealand, Sweden, Switzerland, Western Germany.

The creation of CoCom was in line of the general logic of deterrence in relation to the USSR and Warsaw Pact Organization through putting limits on their technological development. Nevertheless, the Soviet Union was successfully bypassing many restrictions established by the CoCom.

Regime provisions are considered to be as universal requirements. The participating states demand compliance with those trade rules even from countries beyond the *club* as a prerequisite for obtaining products and technologies which are put under export control.

It is also important to note that the EU countries, the United States and some other states, being participants of the export control regimes, adopt special procedures for trading *sensitive goods* with their closest allies. They often use simplified arrangements that do not always require individual export licenses. For those states that do not belong to such exclusive *mini clubs*, a regime membership does not at all guarantee that such privileges could be available to them. For example, Russia, a full-status participant of nearly all the export control regimes, except for the Australia Group, has always remained locked out of groups entitled to such preferences.

Finally, a discussion of export control regimes cannot possibly ignore the crucial, though indirect, role that they play in sanctions policies worldwide. Suffice it to say that the international sanctions introduced a while ago by the UN Security Council against the DPRK and Iran dictated that any trading with these countries should restrict or altogether exclude the nomenclature categories controlled under the export control. The regimes' lists of controlled items have been used as the basis for drawing up lists of goods and technologies subject to a specific ban, adjusted and fine-tuned as appropriate, of course. Western countries have tightened these restrictions even further through national export control instruments.

Each of the existing multilateral export control regimes performs a highly specific set of functions. However similar in their principles of operation and tools employed, the regimes still differ in a number of distinct ways.

After the signing of the Nonproliferation Treaty (NPT), international consultations were held to discuss issues of nuclear export control. Their purpose was to prevent the proliferation of nuclear weapons amid the extensive cooperation on peaceful nuclear technology applications. These consultations led to the establishment of two international mechanisms of export control: the Zangger Committee and the Nuclear Suppliers Group.

ZANGGER COMMITTEE (ZAC)

ZAC, also known as the Nuclear Exporters Committee, was formed in 1971. It is an informal association of states, exporting nuclear materials and technologies, named after its first chairman, Professor Claude Zangger (Switzerland). From its inception, the Committee's first job was to draft a *trigger list* source or special fissionable materials, and equipment or materials especially designed or prepared for the processing, use, or production of special fissionable materials. This task was addressed in line with the NPT.

In 1974, the ZAC agreed the Trigger List. It was published as the International Atomic Energy Agency (IAEA) document INFCIRC/209 as of September 3, 1974, and consisted of

the two memoranda, setting out the basic guidelines for implementing export control provisions:

- Memorandum A covered the export of source and special fissionable material;
- Memorandum B covered the export of equipment and non-nuclear material used in the nuclear industry.

> ***"Each State Party to the Treaty undertakes not to provide: (a) source or special fissionable material, or (b) equipment or material especially designed or prepared for the processing, use or production of special fissionable material, to any non-nuclear-weapon State for peaceful purposes, unless the source or special fissionable material shall be subject to the safeguards required by this Article".***
>
> **Article III.2 of the NPT**
>
> *Source: https://disarmament.unoda.org/wmd/nuclear/npt/text/*

According to the document, nuclear items intended for export listed in both memoranda would *trigger* a requirement for ZAC safeguards and guidelines. They established three conditions of supply[44]:

1. a non-explosive use assurance;
2. an IAEA safeguards requirement;
3. a re-transfer provision that requires the receiving state to apply the same conditions when re-exporting these items.

Since 1974, the Zangger Committee has made six major revisions of the Trigger List as shown below:

Item	Year	Amendments
1.	1977	heavy water production equipment added, and clarification on
2.	1984	isotope separation by gas centrifuge process
3.	1985	clarification on reprocessing plants
4.	1990	clarification on isotope separation plant equipment from the gaseous diffusion method
5.	1994	further clarification to the enrichment section and a modification of the entry on
6.	1996	further clarification of the less sensitive Trigger List items

The agreed status of the Committee has been informal from the very beginning, and its decisions are not legally binding upon its parties. The decisions have entered into legal force with unilateral declarations of each participating country and their request to Director General of the IAEA to publish these unilateral policy declarations in IAEA document INFCIRC/209.

[44] Сообщение от 28 августа 2003 года, полученное от правительства Соединенных Штатов Америки от имени государств – членов Группы ядерных поставщиков // Информационный циркуляр МАГАТЭ (INFCIRC/539/Rev.2), 2003. С. 5.

The following limitations of the Zangger Committee as an export control regime can be outlined[45]:

1. NPT membership is an absolute requirement for joining the ZAC. While restrictions under trigger lists, on the whole, have been compulsory, they have not been implemented by non-NPT nuclear suppliers[46].
2. The ZAC safeguards cover only exports of equipment designed for nuclear use, without defining any provisions for the export of dual-use items.

India's *Peaceful Nuclear Explosion* of May 1974 and also the refusal of France, an active nuclear technology exporter, in those years to become a party to the NPT[47], prompted nuclear suppliers to develop additional export control mechanisms. Representatives of the United Kingdom, Canada, the Soviet Union, the United States, France, West Germany and Japan held a series of meetings in London that led to the establishment of the Nuclear Suppliers Group.

Today the Zangger Committee includes 39 members: Argentina, Australia, Austria, Belarus, Belgium, Bulgaria, Canada, China, Croatia, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Kazakhstan, Luxembourg, the Netherlands, New Zealand, Norway, Poland, Portugal, Republic of Korea, Romania, Russia, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Türkiye, the UK, and Ukraine, the USA.

NUCLEAR SUPPLIERS GROUP (NSG)

NSG was created as an informal voluntary association that was not formalized by any international agreement. Its framework has been used to develop the following elements of export control[48]:

Item	Year	Elements of NSG export control framework	Definition
1	1978	Trigger List	Nuclear material; nuclear reactors and equipment therefor; non-nuclear material for reactors; plant and equipment for the reprocessing,
2	1992	Dual-Use List	Dual-use items and technologies that can be used both for nuclear and non-nuclear applications.

After having finalized its guidelines and export control lists, the NSG had not met until 1991. Later on, the NSG invested considerable effort to develop export controls for du-

[45] Ядерное нераспространение: Учебное пособие для студентов высших учебных заведений. В 2-х томах. Том I / И.А. Ахтамзян и др. Под общ.ред. В.А. Орлова. 2-е изд., переработанное и расширенное. – М.: ПИР-Центр, 2002. – 528 с.
[46] Nevertheless, ZAC agreed to exchange information about nuclear exports to any non-nuclear-weapon states that were not at the moment party to the NPT. To this end, the Committee set up a system of Annual Returns. Since then, they have been circulated on a confidential basis during the meetings of the ZAC member states each year.
[47] France joined the NPT only in 1992.
[48] Антонов А.И. Контроль над вооружениями: история, состояние, перспективы / А.И. Антонов. – М. : Российская политическая энциклопедия (РОССПЭН) ; ПИР-Центр, 2012 . С. 184.

al-use equipment, materials and technologies that could contribute to military nuclear activities. At the end of the 1990s, the Group also agreed on implementing the *catch-all* mechanism to control dual-use products and technologies through supplementary measures under national export control systems. The mechanism authorizes NSG members to block any export suspected to be destined to a nuclear weapons program, even if it does not appear on one of the control lists.

Today NSG includes 48 members: Argentina, Australia, Austria, Belarus, Belgium, Brazil, Bulgaria, Canada, China, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Kazakhstan, Latvia, Lithuania, Luxembourg, Malta, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Republic of Korea, Romania, Russia, Serbia, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Türkiye, the UK, Ukraine, the USA.

However similar in their functions, the ZAC and the NSG have substantial differences in status and areas of control: while the Zangger Committee predicates its guidelines on the NPT's Article III.2 and defines controls for its Trigger List of especially designed and prepared nuclear export items, the NSG is an informal association, members of which also control dual-use transfers outside the trigger list. Without doubt, the NSG plays a bigger role in shaping the contemporary architecture of nuclear export control.

FOOD FOR THOUGHT

In 1998, India conducted five tests of nuclear weapons, including thermonuclear ones. They were not declared peaceful that time as it was in 1974, and India de facto joined nuclear club. In terms of law, it did not violate anything because it never signed or accepted the NPT. But India was subjected to international sanctions on nuclear supplies and technology including by NSG. Ten years later, they were cancelled due to renewed US-India cooperation in nuclear domain. NSG sanctions against India were lifted. For some experts such circumstances undermined confidence in export control regimes, as the NSG departed from its guidelines and the situation itself demonstrated that they could be applied ad hoc.

MISSILE TECHNOLOGY CONTROL REGIME (MTCR)

MTCR was established in 1987 by the UK, Germany, Italy, Canada, the United States, France and Japan to limit the fast proliferation of missile technology in the world. The regime introduced controls over exports of equipment and technologies suitable for producing missiles. Its aim was not to ban the exports of missile technology *per se*, which would have been completely unrealistic with missiles being legitimate conventional weapons, but to prevent their spread as the WMD delivery systems. This determined the regime's key parameters that impose almost prohibitive restrictions on missiles capable of delivering a payload of at least 500 kg to a range of at least 300 km. The MTCR consists of the two documents:

1. MTCR Guidelines and Equipment;
2. Software and Technology Annex.

FOOD FOR THOUGHT

It is rather practically impossible to prohibit missiles in general. They are legitimate conventional weapons, means of warfare and self-defense, and no one state would be ready to put any limits on its missiles program development. The main idea of establishing MTCR in its initial form was to control and restrict export of missiles beyond this club of states. Today many countries, especially the US and European Union members, are criticizing Iran in terms of missiles proliferation. According to the Joint Comprehensive Plan of Action (JCPOA), on October 18, 2023, all the UN Security Council restrictions for Iranian missile program including to put a limit on export of its ballistic missiles were expired. Nevertheless, the EU declared in October 2023 that it would continue missile embargo towards Iran beyond the UN accusing the country of violating the JCPOA. Such a politically motivated behavior is not correct as such restrictions should be imposed only by the UN SC, and hardly can Iran be blamed for not following the JCPOA while it was the US first to withdraw from the agreement in 2018 and to restore sanctions pressure on Iran.

The analysis of the MTCR's original configuration reveals the following key characteristics and limitations[49].

First, it has a *limited scope*. The MTCR restricted exports of only WMD delivery systems. The Annex includes two categories: 1) complete rocket and unmanned aerial vehicle (UAV) systems capable of delivering at least a 500 kg payload to a range of at least 300 km, and their subsystems; 2) other rockets and UAV systems with range of at least 300 km and missile-related dual-use products and technologies[50]. Among others, the restrictions apply to cruise missiles, unmanned and remote-controlled systems.

Second, the MTCR used *a discriminatory approach*. Initially, some countries were exempt from any restrictions on transferring missile equipment and technology. Israel is one of the cases in point.

Third, the MTCR was established as an *informal group*. The regime initially is based on statements made by the seven founding states, while other countries can commit to the regime on a unilateral basis, but their membership is subject to approval by the group on specific conditions.

Today MTCR includes 35 members: Argentina, Australia, Austria, Belgium, Brazil, Bulgaria, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, India, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Poland, Portugal, Republic of Korea, Russia, South Africa, Spain, Sweden, Switzerland, Türkiye, the UK, Ukraine, the USA,

China, Israel, and Romania declared that they would adhere to the MTCR in spite of not being members.

[49] Ядерное нераспространение: Учебное пособие для студентов высших учебных заведений. В 2-х томах. Том I / И.А. Ахтамзян и др. Под общ.ред. В.А. Орлова. 2-е изд., переработанное и расширенное. – М.: ПИР-Центр, 2002. – 528 с.
[50] Режим контроля за ракетной технологией (РКРТ) (Справка) // Официальный сайт МИД России.

AUSTRALIA GROUP (AG)

AG is an informal association of countries seeking to prevent the proliferation of chemical and biological weapon components through instituting uniform national export control regulations and practices. It was established in 1985 after Iraq used chemical weapons against Iran in 1984 during the war between the two countries (1980-1988).

AG includes 43 members: Argentina, Australia, Austria, Belgium, Bulgaria, Canada, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, India, Ireland, Italy, Japan, Latvia, Lithuania, Luxemburg, Malta, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Republic of Korea, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye, the UK, Ukraine, the USA and European Union.

Kazakhstan has a status of AG Adherent. Countries which are Adherents to AG notify the AG Chair in writing of their political commitment to adhere to the AG Guidelines and Common Control Lists and any subsequent changes. This adherence is unilateral by the non-member country and not subject to any acceptance decision by the AG membership.

Russia does not participate in the AG's activities. In the past, Russia made efforts to become its full member, sending clear signals that the Russian export control system was completely ready to operate in line with the regime's rules and norms. The matter of Russia's potential membership in the Group was more than once considered at the meetings of the AG's governing bodies, but the United States and its allies made their best to prevent this from happening. Russia was offered unacceptable and discriminatory preconditions of membership that were simply impossible to fulfil. Therefore, Russia stopped its attempts to join as well as any formal contacts with the regime. Nevertheless, Russia is monitoring the AG's activities and continuously improving its control system in line with current trends. On some parameters, Russian export controls over chemical and biological products and technologies are even tighter than the AG standards.

WASSENAAR ARRANGEMENT (WA)

Founded in 1996, WA serves as a mechanism to preserve and strengthen international stability and security by increasing the responsibility and transparency of participating states policy in transfers of military items thus preventing destabilizing accumulations of conventional arms.

The participating states committed themselves to establish export control over military related transfers, annually review control lists, and have in place effective licensing procedures on the basis of universal criteria that should be taken into account while considering license applications. They are also obliged to exchange information on military related transfers and denials with partners.

As the WA controls transfers of conventional weapons, unlike other export control regimes dealing with WMD and related delivery systems, this regime does not set out any prohibitive requirements. Transfer of any item or its denial is left to the exclusive discre-

tion of each participating state. All measures adopted in connection with the WA's agreements should comply with the national laws and policies.

The WA participants meet for plenary sessions, the General Working Group, the Experts Group, which revises the lists of controlled items, and the Licensing and Enforcement Officers Meeting. The WA member states make all their decisions based on consensus.

Twice a year, the WA participants exchange information on transfers of their weapons (under eight categories) and most sensitive dual-use items to non-WA countries and also on denials to transfer controlled dual-use goods and technologies to such destinations.

The WA has an established process for exchanging information on military and industrial programs that raise concerns among WA participants, on trends in arms or dual-use goods trade, or emergence of new types of products and technologies that require export control.

In terms of the Arrangement's purposes set forth in its founding documents, the principal measure of its effectiveness is how well it prevents weapons from finding their way to regions of instability and armed conflicts. But the WA cannot operate in isolation from the current geopolitical developments, which becomes increasingly manifest in today's turbulent political climate. So, the question is as pertinent as ever whether the Wassenaar Arrangement is adequate to the current reality and capable of functioning in the foreseeable future.

WA includes 42 members: Argentina, Australia, Austria, Belgium, Bulgaria, Canada, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, India, Ireland, Italy, Japan, Latvia, Lithuania, Luxemburg, Malta, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Republic of Korea, Romania, Russia, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Türkiye, the UK, Ukraine, the USA.

CONCLUSION

Overall, modern multilateral export control mechanisms are still the critical components of the arms control and WMD nonproliferation architecture and have long been an integral factor to maintaining strategic stability. Nevertheless, today these regimes are facing multiple challenges stemming from the deep divisions in the global community that is essentially incapable of effectively solving many of the pressing issues of international security. One should only hope that the world would be able to come over this period of uncertainty and go back to a normal productive cooperation that would surely bring benefits to all parties without exception.

It is also important to bear in mind that export control mechanisms are subject to double standards when their norms and provisions can be used against foreign policy opponents. Such manipulation of international law could erode the architecture of export controls. All states of the world should do their utmost to not allow such situations in order to prevent subsequent proliferation of WMD all over the globe. ■

PAPER 9.

LONG TIME NO FIND. IRAN AND ITS NUCLEAR PROGRAM

Adlan Margoev

HOW LONG TO BUILD A WEAPON?

How long would it take Iran to build a nuclear weapon? The history of this issue and the news coverage dates back to the early 1990s. In 1992, the Washington Post wrote an article titled Nuclear Warheads for Iran. The similar topic can be found in Los Angeles Times. The first piece was about Iran's alleged attempts to buy several nuclear warheads from Kazakhstan. The second one from the same year speculated about some missing nuclear weapons in Kazakhstan potentially appearing in Iran. In 1995, the first intelligence estimates come to media that Iran may be able to build an atomic bomb in 5 years. If one traces back all the claims by Prime Minister of Israel Benjamin Netanyahu (1996-1999; 2009-2021; 2022-present) about Iran's potential to build a nuclear weapon, they will see that almost every several years starting from 1992 he has been warning the public that Iran would soon develop a nuclear weapon. One of the US officials John Bolton went further in 2015 when he suggested that Iran itself should be bombed.

Western Media coverage of the possible Iranian nuclear ambitions

Source: open data

When would Iran be ready to produce a nuclear weapon? Even the US intelligence community was confused with its own assessments. In 2005, its experts estimated with high confidence that Iran was determined to develop a nuclear weapon despite the international obligations. But in 2007, they understood that Iran was not prepared to do so. If we turn to the 2007 US National Intelligence Estimate *Iran: Nuclear Intentions and Capabilities*, we will see how different the assessment of Iran's nuclear program became in 2007, and that means even some of the strongest intelligence communities in the world are not exempt from making mistakes.

2005 IC Estimate	2007 National Intelligence Estimate
Assess with high confidence that Iran currently is determined to develop nuclear weapons despite its international obligations and international pressure, but we do not assess that Iran is immovable.	Judge with high confidence that in fall 2003, Tehran halted its nuclear weapons program. Judge with high confidence that the halt lasted at least several years. (DOE and the NIC have moderate confidence that the halt to those activities represents a halt to Iran's entire nuclear weapons program.) Assess with moderate confidence Tehran had not restarted its nuclear weapons program as of mid-2007, but we do not know whether it currently intends to develop nuclear weapons. Judge with high confidence that the halt was directed primarily in response to increasing international scrutiny and pressure resulting from exposure of Iran's previously undeclared nuclear work. Assess with moderate-to-high confidence that Tehran at a minimum is keeping open the option to develop nuclear weapons.

Key differences between the US National Intelligence Estimate about Iranian nuclear program issued in 2005 and in 2007.

Source: https://www.armscontrolwonk.com/archive/202469/2005-iran-nie-details/

Those who do not have access to confidential information can rely on the data from official organizations like the International Atomic Energy Agency (IAEA). According to the final assessment of the possible military dimensions of Iran's nuclear program that was delivered by the IAEA in December 2015, there was a range of activities relevant to the development of a nuclear explosive device in Iran prior to 2003, but these activities did not advance beyond the feasibility in scientific studies, as well as gaining some of the technical competencies and capabilities, and the Agency did not have by December 2015 any relevant information about the development of a nuclear explosive device after 2009[51].

There is an analytical frame that is often used in media and some of the official documents, especially in the US, that is called the *breakout time*. Basically, breakout time refers to the ability to take nuclear material and enrich it to a point when they would have enough material to produce the first nuclear explosive device. The calculation is based on the measurement called *separative work unit* (SWU), that is the amount of effort that

[51] Final Assessment on Past and Present Outstanding Issues regarding Iran's Nuclear Programme GOV/2015/68, December 2, 2015 // IAEA.

nuclear scientists have to make in order to enrich a certain amount of nuclear material to a certain level with the aim to produce the first nuclear explosive device.

> "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".
>
> **Final Assessment on Past and Present Outstanding Issues regarding Iran's Nuclear Programme. Report by the Director General. IAEA December 2, 2015**
>
> *Source: https://www.iaea.org/sites/default/files/gov-2015-68.pdf*

It would take Iran 96 SWUs to enrich 33 kg of uranium enriched to 60 percent, which they currently have, and up to 20 kg enriched to the 90 percent level. Then if they want to build the second nuclear explosive device from the same pool of 60 percent enriched uranium, they need to spend another 96 SWUs to enrich additional 33 kg of 60 percent uranium and bring it to 90 percent. You can see from the table that Iran could produce at least five nuclear explosive devices from the material that it had as of September 2023.

For Iran's ___ nuclear weapon	It could draw from its stockpile of ___	It would draw ___ from this stockpile	To make ___ enriched to 90%	It would require ___ of effort	For a total effort of ___
First	121.6 kg up to 60% U-235 (~54%)	33.6 kg	20 kg	96 SWU	96 SWU
Second		33.6 kg	20 kg	96 SWU	192 SWU
Third		33.6 kg	20 kg	96 SWU	288 SWU
Fourth		20.8 kg	12.4 kg	59 SWU	467 SWU
	535.8 kg up to 20% U-235 (~18%)	39.8 kg	7.6 kg	120 SWU	
Fifth		104.7 kg	20 kg	315 SWU	782 SWU

Iran's Nuclear Timetable: The Weapon Potential (as of September 21, 2023)

Source: https://www.wisconsinproject.org/irans-nuclear-timetable-the-weapon-potential/

What lacks here in this assessment is that it is not only about enriching nuclear material to provide enough material for a nuclear explosive device. It is also about the design and the construction of the nuclear explosive device and integration of that first nuclear explosive device and the consequent ones into a ballistic missile delivery system that would make it a nuclear weapon. Those types of calculations are not easily made. It is not about the math. It depends on many different factors.

"Although the **production of fissile material** is arguably the most resource intensive and difficult step toward building nuclear weapons, there are several additional technical hurdles, including

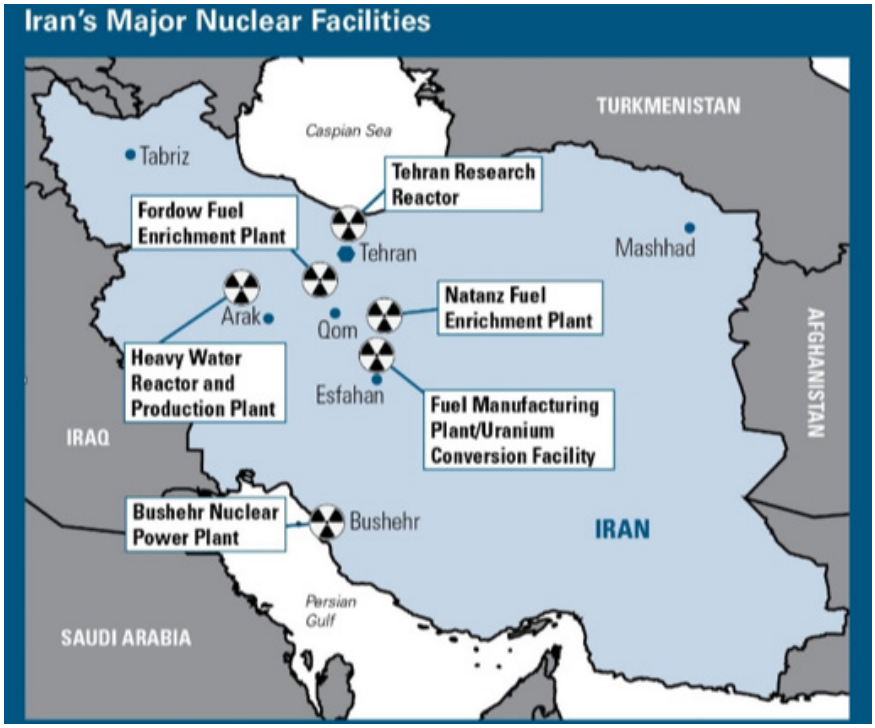
- **designing and constructing an explosive device** and
- **integrating it into a delivery system** (most likely a ballistic missile) so it would reliably detonate.

Moreover, these technical criteria constitute an important but incomplete lens through which breakout must be viewed. Real-world timelines must also take into account a broad range of legal and political factors inside and outside Iran. The success or failure of a breakout attempt would depend on

- the **quality** and scope of the international **inspection regime**,
- the ability of the **international community** to **respond effectively** to disrupt the breakout, and
- the **number of weapons** Iran would judge to be a credible deterrent".

Solving the Iranian Nuclear Puzzle
An Arms Control Association Briefing Book
June 2014

Source: https://www.armscontrol.org/files/ACA_Iran_Briefing_Book_2013.pdf



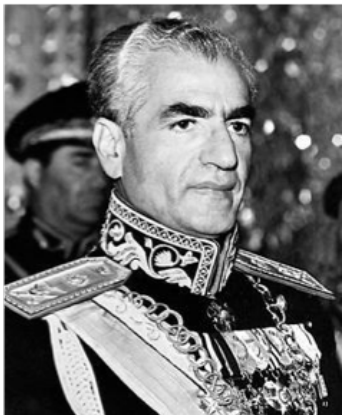
Solving the Iranian Nuclear Puzzle. An Arms Control Association Briefing Book (as of June 2014)
Source: https://www.armscontrol.org/files/ACA_Iran_Briefing_Book_2013.pdf

Regarding nuclear infrastructure, Iranians have a variety of facilities ranging from uranium milling sites and fuel production sites to research and power reactors, but they do not have a full closed nuclear fuel cycle. That means there is no refabrication of irradiated fuel for plutonium extraction. So, if the *Arak* heavy water reactor is not operated based on its original design, the plutonium path is not an optimal solution for Iranians should they consider developing a nuclear weapon.

WHY IRAN SEEKS AN ADVANCED NUCLEAR PROGRAM

Why does Iran seek an advanced nuclear program? Is it all about the political system in Iran since 1979? Not at all.

The story goes back to the 1950s, when Iran was considered one of the US allies in the Middle East. After the delivery of the *Atoms for Peace* speech, American President Dwight Eisenhower (1953-1961) decided to engage Iran in the spread of peaceful nuclear technology. It was the United States that agreed around 1958 to deliver the first research reactor to the University of Tehran. But the key nuclear developments in Iran took place after 1974, around the time when the Indian *peaceful nuclear explosion* test took place.



Mohammad Reza Pahlavi, Shah of Iran (1941-1979)
Source: open data

Akbar Etemad, President of the Atomic Energy Organization of Iran (1974-1978). *Father* of Iran's current nuclear program
Source: open data

The memoirs of people involved in the court politics and some of the interviews of Mohammad Reza Shah demonstrate that in 1950-1970s the Iranians thought of developing an advanced nuclear program. In case the regional situation deteriorated and posed a threat to Iran's national security, the Shah reserved the option to go nuclear. However, there was no condition back then to motivate the Iranians to choose the military path.

After the 1979 Revolution, most of the contracts between Iran and its international partners, vendors from the United States, Germany, France, and other countries, were canceled either by those partners or by Iran itself. In fact, Ruhollah Khomeini, the First Supreme Leader of Iran (1979-1989), was against nuclear technology and wasteful contracts that Iran made with those countries.

But in 1980, Saddam Hussein started a war with Iran in which he used chemical weapons on the battleground. Iran received almost no support from the international com-

munity to fight back, and some of the Iranian officials decided that it would be better to revitalize the nuclear industry in case they would have to develop a nuclear weapon as an ultimate guarantor of national security. Nuclear weapons were not considered as the primary option, but Iran was interested in developing a certain level of technology that would, in case of a dire security situation in the region, help Iran to defend itself from the adversaries in the Middle East.

If we summarize some of the reflections on this issue under both the Shah and the Supreme Leader, we will see several parallels in Iran's motivation for developing a nuclear industry. The first one is an ultimate defense in case Iran has to develop a nuclear weapon. Second, regardless of the military or peaceful way of developing technology, being an advanced country in terms of technology, nuclear industry, and knowledge economy was considered as a matter of prestige both before 1979 and afterwards. And, third, there is a motivation of Iran to develop a nuclear industry for the energy and non-energy applications. Iran is still suffering from the lack of electricity in certain regions, and despite being an oil- and gas-rich country, it sees value in building more power generation infrastructure in the country. Non-power applications of nuclear energy, such as in medicine, drive forward science and engineering in Iran. So, Iran's advanced nuclear program is about security, prestige, and scientific progress, regardless of the political system.

A SHORT-LIVED SUCCESS OF THE IRAN NUCLEAR DEAL

In 2015, after more than 13 years of negotiations, the parties managed to reach an agreement, called the Iran nuclear deal, or the Joint Comprehensive Plan of Action (JCPOA). But its success happened to be short-lived.

Enrichment	• For 10 years operating centrifuges reduced to 5,060 IR-1 machines, total machines is 6,104 IR-1s • Excess centrifuges (over 13,000) dismantled and stored under IAEA monitoring • For 15 years level of uranium enrichment capped at 3.67 percent uranium-235 • For 15 years enrichment only at Natanz • For 10 years no production of additional IR-1 centrifuges • Between years 11-13 Iran can replace IR-1s with the equivalent capacity of IR-6 and IR-8 machines and limits lasting to years 14-15
Uranium Stockpile	• For 15 years the stockpile is kept under 300 kilograms of 3.67 percent enriched uranium in total (all forms) • Excess enriched uranium sold, shipped abroad for storage, or diluted to natural uranium levels • Uranium oxide and scrap material enriched up to 20 percent fabricated into fuel for Tehran Research Reactor, blended down, or shipped out
Fordow	• Converted to research facility for stable isotope production with Russian cooperation • 1,044 IR-1 centrifuges in six cascades will remain here, 328 for production, the remaining 700 are idle • For 15 years no introduction of uranium at the facility
Advanced Centrifuge Research and Development	• For 8.5 years Iran may conduct research with uranium on a single IR-4, IR-5, IR-6 and IR-8 centrifuge at Natanz • After 8.5 years test up to 30 IR-6s and 30 IR-8s • After 8 years manufacture up to 200 IR-6s and 200 IR-8s centrifuges without rotors • For 10 years Joint Commission review and approval of changes to the research and development plan
Arak Reactor	• Remove and disable the original core of the Arak reactor • Replace the core of the Arak reactor to reduce weapons-grade plutonium output, certified by the Joint Commission • For 15 years no reprocessing of spent nuclear fuel with an intention to never reprocess • Permanent commitment to ship out spent nuclear fuel • For 15 years no heavy-water reactors in Iran • For 15 years no accumulation of heavy water in Iran • Construction of hot cells or shielded glove boxes of certain specifications subject to approval of the Joint Commission
Monitoring and Verification	• By 15 October 2015 Iran fully implements PMD "roadmap" agreed with IAEA • For 10 years approval of the purchase of dual-use materials by the Joint Commission working group • For 25 years continuous monitoring of Iran's uranium mines and mills • For 20 years continuous monitoring of Iran's centrifuge production facilities • For 15 years Joint Commission oversight of IAEA access requests to inspect undeclared sites • Permanent prohibition of certain weaponization related activities • Implementation and eventual ratification of an additional protocol to Iran's safeguards agreement • Permanent implementation of modified Code 3.1 of the Subsidiary Arrangements to its Safeguards Agreement

Joint Commission	• For 25 years Joint Commission (composed of P5+1, EU and Iran for a total of 8 voting members) will hold quarterly meetings, or by request, to oversee the deal • Dispute resolution mechanism within 35 days; 15 day dispute resolution mechanism within the Joint Commission, with optional 15 day ministerial review and/or arbitration opinion from a 3 member panel, followed by 5 day review of the arbitration opinion. If no resolution and complaining party sees action as "significant non-performance," the unresolved issue can be treated as grounds to cease performing commitments in whole or part, complaining party will notify UN Security Council • Any party can go to the UN Security Council to put sanctions back in place if there is noncompliance by vetoing a resolution calling for the continuance of sanctions
UN Sanctions	• UNSC resolution 2231 endorsing JCPOA outlines termination of all previous resolutions targeting Iran's nuclear program—1696 (2006), 1737 (2006), 1747 (2007), 1803 (2008), 1835 (2008), 1929 (2010)—on implementation day. • For 10 years sanctions are subject to snapback by veto of a resolution calling for the continuation of suspension • After 10 years UN will cease to be seized of Iran's nuclear file • For 5 years the heavy arms embargo will remain in place • For 8 years the ballistic missile restrictions will remain in place
U.S. Sanctions	• Cease the application of economic sanctions against Iran's oil and banking sector allowing Iranian banks and companies to reconnect with international systems • Will remove designation of certain entities and individuals • Allows for licensed non-U.S. entities that are owned or controlled by a U.S. person to engage in activities with Iran permitted under JCPOA • Allows for the sale of commercial passenger aircraft to Iran • Allows for license for importing Iranian-origin carpets and foodstuffs into United States • United States takes appropriate measures to address laws at state or local level preventing full implementation of JCPOA – United States will actively encourage officials to adhere to JCPOA policy • For 8 years after Adoption date, or sooner if IAEA concludes that all nuclear activity in Iran remains peaceful, U.S. will seek legislative action to terminate/modify nuclear related sanctions • U.S. sanctions on Iran targeting human rights, terrorism and missile activities remain • United States can impose additional sanctions for non-nuclear issues (terrorism, human rights, etc.)
EU Sanctions	• Terminate all provisions of the EU Regulation related to Iran's nuclear program • Includes: financial and banking transactions; transactions in Iranian Rial; provision of U.S. banknotes to Iranian government; access to SWIFT; insurance services; efforts to reduce Iran's crude oil and petrochemical product sales; investment; transactions with Iran's energy and shipping sector; trade in gold and other precious metals; trade with Iran's automotive sector • Removes individuals and entities designated under sanctions • EU refrains from re-introducing sanctions terminated under JCPOA (Iran views any re-introduction as grounds to cease performing its commitments) • Refrain from policy intended to adversely affect normalization of economic relations with Iran • For 8 years after adoption day or at the finding of the IAEA broader conclusion EU's arms embargo and restrictions on transfer of ballistic missiles remain

Key requirements and actions mandates by the JCPOA

Source: https://www.armscontrol.org/factsheets/JCPOA-at-a-glance

Prior to this agreement, Iran had around 19.000 centrifuges, of which 13.000 centrifuges were dismantled and stored under the IAEA supervision under the deal. Iran was also prohibited from using many advanced centrifuges that it had already developed for research purposes. The Fordo enrichment facility was to be converted to a radioisotope production and research facility with the participation of the Russian nuclear industry representatives. So, for 15 years enrichment could take place only at Natanz. The cap for the stockpile of enriched uranium was set at 300 kg of uranium enriched to 3.67 percent. This secured a year-long breakout time for Iran, meaning for as long as the JCPOA was in full force, if Iran decided to develop a nuclear weapon, it would need at least one year to enrich enough nuclear material for its first nuclear device. Never since the collapse of the JCPOA has such a long break-out time been restored. In exchange for that, the United States and the European Union agreed to lift sanctions against Iran's nuclear program, oil industry, etc. Non-nuclear sanctions were kept intact.

The JCPOA negotiation led to success thanks to at least four factors.

- First, a lot depended on the coherence of domestic political cycles in Iran and in the United States as the key opponents in this process. When the first clandestine nuclear facilities were revealed around 2002 in Iran, President of Iran was Mohammad Khatami (1997-2005), who was considered to be a reformist politician, ready to engage with the world and with the United States as well. But the US President George W. Bush (2001-2009) was not ready to respond to any diplomatic gesture by the Iranians. Then President Mahmoud Ahmadinejad (2005-2013) came to power in Iran, and despite the fact that US President Barack Obama (2008-2017) was ready to engage in diplomacy with Iran, it was Iran's turn to reject diplomatic efforts. Only around 2013, under the second administration of President Obama and the first administration of Iranian President Hassan Rouhani (2013-2021), the two sides managed to handle the domestic politics and secure the agreement. And according to the memoirs of some Iranian politicians, handling this domestic environment, in many cases, was more difficult for them than working at the same table with their opponents. So, when the domestic political cycles matched in Iran and in the US, the deal became possible.

- Second is the compartmentalization of Iran's nuclear dossier from all of the other issues that spoiled the relations between Iran and the West. When the negotiators prioritized the nuclear dossier as the most pressing issue on the agenda, the success became possible. Otherwise, piling up everything in one negotiation process would be counterproductive; it would be impossible to reach a package solution to the issues that caused disagreements between Iran and the West.

- Third, the step-by-step and reciprocity approach suggested by the Russian Federation around 2011 played a positive role. The negotiators could not handle all the issues at the same time, including due to mutual lack of trust. The only viable solution was to move forward by small reciprocal steps and see if the other side is delivering on its promises. That set the right pace for the negotiations after 2013 that led to the 2015 success.

- Four, it was not only sanctions that motivated Iran in 2013 to come to the negotiation table with the sincere expectations of moving forward together. The Obama administration, for the first time in more than a decade, offered a real incentive to the Iranians. Apart from removing sanctions, they recognized Iran's right to enrich uranium and de-

velop other aspects of its indigenous nuclear industry. Of note, in 2005 the previous successful round of talks between Iran and the E3 – France, Great Britain, and Germany – failed in large part because of US unwillingness to recognize Iran's right to peaceful uses of nuclear energy under the Nuclear Nonproliferation Treaty (NPT).

> ***"President Trump is terminating United States participation in the JCPOA, as it failed to protect America's national security interests. The JCPOA enriched the Iranian regime and enabled its malign behavior, while at best delaying its ability to pursue nuclear weapons and allowing it to preserve nuclear research and development. The President has directed his Administration to immediately begin the process of re-imposing sanctions related to the JCPOA. The re-imposed sanctions will target critical sectors of Iran's economy, such as its energy, petrochemical, and financial sectors. Those doing business in Iran will be provided a period of time to allow them to wind down operations in or business involving Iran. Those who fail to wind down such activities with Iran by the end of the period will risk severe consequences. United States withdrawal from the JCPOA will pressure the Iranian regime to alter its course of malign activities and ensure that Iranian bad acts are no longer rewarded. As a result, both Iran and its regional proxies will be put on notice. As importantly, this step will help ensure global funds stop flowing towards illicit terrorist and nuclear activities".***
>
> **President Donald J. Trump is Ending United States Participation in an Unacceptable Iran Deal**
> **May 8, 2018**
> *Source: https://trumpwhitehouse.archives.gov/briefings-statements/president-donald-j-trump-ending-united-states-participation-unacceptable-iran-deal/*

However, the deal happened to be unsustainable because of at least two reasons. First, due to the above-mentioned mismatch in domestic political cycles. Unfortunately for President Rouhani and all the JCPOA negotiators, the second presidency of Hassan Rouhani overlapped with the first and so far the only presidential term of Donald Trump (2017-2021) who left the agreement despite the United Nations Security Council (UN SC) Resolution № 2231 in support of the deal. The Iranians were deprived of the benefits under the JCPOA. The second reason for its unsustainable nature was the lack of balanced verification and enforcement mechanisms.

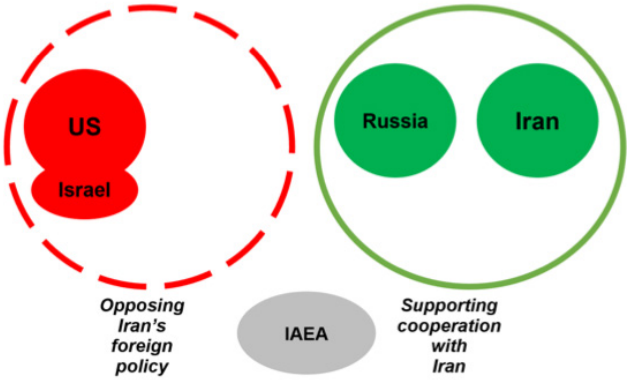
The strongest monitoring and inspections regime was created for Iran to check every single aspect of its nuclear program, but there was no verification mechanism for sanctions removal because it never existed. It was hard to measure how sincerely one would remove sanctions, whether the removal would work, whether there was enough outreach to banks and companies for them to safely resume business with the Iranians. Signing executive orders and removing sanctions on paper was not enough; it required a lot of effort in practice, something nobody could measure with the same success as an inspector of the IAEA at any nuclear facility in Iran. The enforcement mechanism had its fallacy as well: if Iran decided to leave the JCPOA, other parties to the JCPOA would treat Iran as if it violated the agreement. The snapback mechanism could automatically return all sanctions that were imposed on Iran under the auspices of the United Nations since 2006. Meanwhile, the United States faced no pressure for simply leaving the agreement that it had been working on tirelessly with the other participants of the deal. Violation could be

considered worse than not abiding by the agreement at all. Hence, for future agreements with Iran, the latter would require a more balanced mechanism of verification and enforcement.

WHY THE SIX COUNTRIES AND IRAN NEGOTIATED

One can see at least six stages in which negotiations over Iran's nuclear program evolved over the past 30 years.

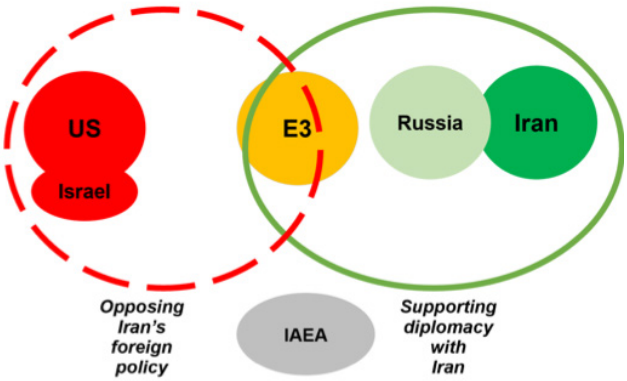
1992-2002. The United States and some of its allies, for example, Israel have been the most prominent advocate of containing Iran's nuclear program. They both opposed Iran's nuclear program development and regional policy. As it was previously mentioned, since the early 1990s Benjamin Netanyahu has been constantly warning about the pace of development of Iran's nuclear program. Thanks to the lobbying in the US Congress, Israel had a very prominent role in the US domestic debate on Iran as well.



Nuclear diplomacy with Iran (1992-2002)

By the end of the 1990s, Russia remained the only partner of Iran in the nuclear industry thanks to the construction of the Bushehr Nuclear Power Plant. The agreement on that was signed in 1995. There was no diplomatic process on Iran's nuclear program in 1990s, but this issue was among the top three that Russian and the United States discussed throughout the 1990s. The IAEA was involved in the discussions as well as an impartial technical body, and it traced many of the aspects of Iran's nuclear program development.

2003-2005. The situation changed after 2002 when the first clandestine nuclear facilities were revealed in Iran, and the multilateral negotiation started. The European states – France, Germany, and Great Britain, or E3 – were the first to volunteer as negotiators with Iran. They signed two successful declarations, the 2004 Tehran Declaration and the 2005 Paris Declaration that secured progress in the talks.



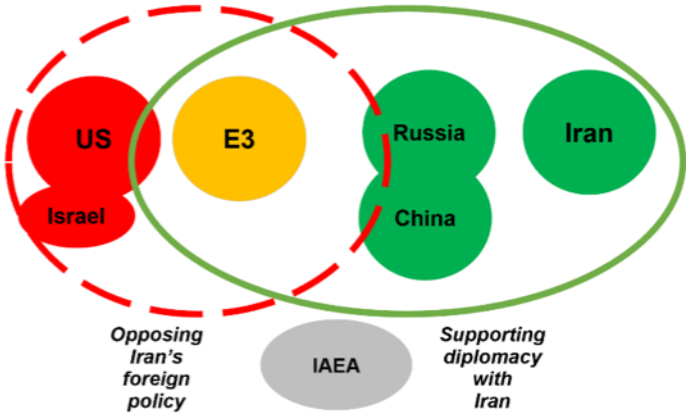
Nuclear diplomacy with Iran (2003-2005)

However, in 2005, under heavy influence of the United States, the Europeans made a final offer to Iran with a provision that prohibited uranium enrichment in Iran for ten years after signing the document. Iran rejected the offer since it was imbalanced in nature.

At that time the E3 happened to be in between two circles. They sincerely supported nuclear diplomacy with Iran, but at the same time they shared concerns with the United States, Israel, and some other allies and partners in the Middle East regarding Iran's regional policy. For the time of the talks and since then, Iran's nuclear program was effectively monitored by the IAEA for the negotiators to understand the technical realities on the ground. Of course, there were many questions about Iran's past activities, some of which remain to be clarified today, but from the nonproliferation standpoint their relevance for today's nuclear activities in Iran and the current level of the program remains limited, if not marginal.

Russia did not play a role in talks between the E3 and Iran, but it did support diplomacy with Iran at the IAEA. The US under the Bush administration preferred to stay away from the diplomatic process led by the European countries. So, the IAEA was a venue for some of the heated political debates that are going on today as well.

2006-2012. The situation further deteriorated when the administrations of George Bush and Mahmud Ahmadinejad severely disagreed with one another. Under mounting US pressure, Iran's President made bold statements and strongly defied the West, which drove the E3 closer to the United States. The E3 lost their agency at a point when they suggested that Iran suspend the enrichment for ten years. Iran's confidence in the Europeans as the key mediators in this process faded away, and the failed talks led to the transfer of the Iranian nuclear dossier from the IAEA to the UN SC. All the permanent members of the UN SC had to engage, including the United States, Russia, and China, because they had to agree on every single aspect of the future sanctions regime on Iran.



Nuclear diplomacy with Iran (2006-2012)

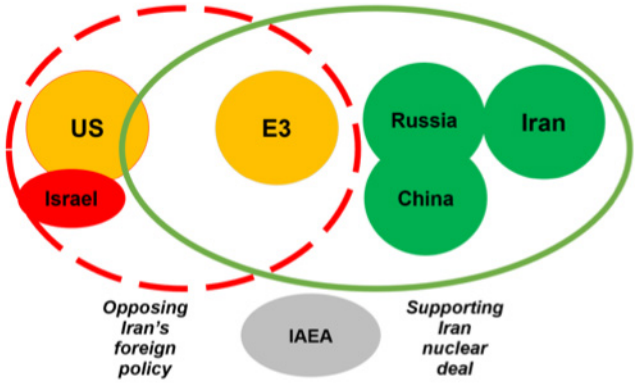
That period of negotiations is called either E3/EU+3 (EU as a coordinator of this process), or P5+1, meaning the five permanent members of the UN SC, and Germany that was part of this process since 2003. Iran was unwilling to abide by the initial UN SC resolution that required Iran to pause its nuclear activities and open up the venue for diplomacy. Having refused to surrender, as it perceived the situation, Iran faced four UN SC resolutions imposing universal legally binding sanctions.

Russia and China appeared in a delicate position between the US and Iran: they had enough empathy towards the Iranians but at the same time, they had to defend the status of both the NPT and the UN SC. When Tehran defied the UN SC, Moscow and Beijing had to agree on further international sanctions against the Iranian nuclear program. But at every instance, the two countries tried to water down the language in a way that would leave some space for future diplomatic efforts with the Iranians. If it had no constructive impact on Iran's position, they moved forward.

In 2010, the last UN SC resolution introduced the harshest sanctions on the Iranian economy. In 2012, the European Union introduced the heaviest European sanctions coordinated with the United States. That period saw a lot more unhelpful events, including cyberattacks against Iran's key enrichment facility, the assassination of its nuclear scientists, which seemingly led to an impasse.

Until 2012, no meaningful diplomacy could be envisioned on Iran's nuclear program. But the Obama administration made a secret attempt to negotiate with Iran. The consultations took place in Oman and opened up the opportunity for the rest of the negotiators to engage back in the talks.

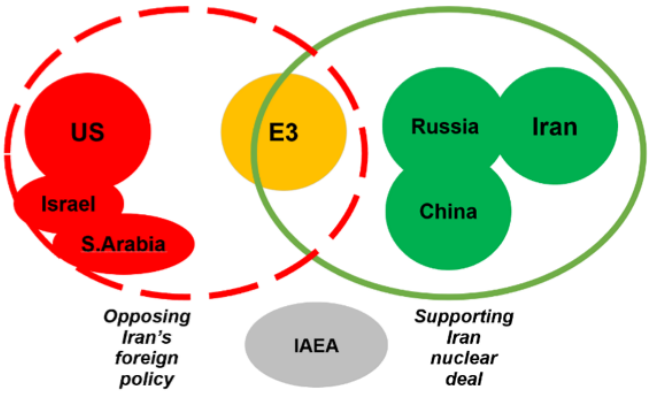
2013-2016. Based on the step-by-step and reciprocity approach, the parties first concluded the Joint Plan of Action (JPA) in 2013, and on July 14, 2015, reached the Joint Comprehensive Plan of Action. The IAEA held a separate track of negotiations with Iran: the successes on the diplomatic track and on the technical track of negotiations reinforced one another.



Nuclear diplomacy with Iran (2013-2016)

The United States and E3 are colored yellow in the chart because, despite supporting diplomatic efforts on Iran's nuclear program, they shared concerns about Iran's regional policy and its missile program. These concerns were among the reasons why the deal unraveled in the next period.

2017-2021. When Donald Trump became President of the United States in 2017, his administration rejected the compartmentalization approach. At first point, the Europeans opposed those developments and defended the deal they had struggled to secure for over a decade. All of a sudden, the Europeans happened to be on the same page with Russia and China with respect to the Iran nuclear deal, but they could not act independently. The E3/EU proved incapable of acting without the support of the United States, which demonstrated their irrelevance to the Iranians.

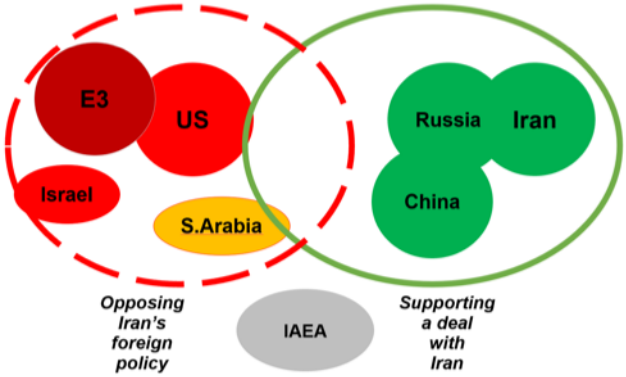


Nuclear diplomacy with Iran (2017-2021)

Meanwhile, the Russian and the Chinese relationships with Iran got stronger. Conversely, Saudi Arabia had cut diplomatic relations with Iran because of domestic political disagreements and joined the ranks of the JCPOA opponents. Under President Joe Biden, talks on the revival of the JCPOA resumed and almost resulted in an agreement in August

2022, but issues extraneous to the talks spoiled the opportunity. The IAEA as a technical body could not solve the political problems. Instead, those disagreements spilled over the technical discussions at the IAEA over Iran's past nuclear activities.

2022-2023. In fall 2022, two developments precluded the revival the JCPOA and made the United States and the E3 refuse to continue the talks. First, Iran's government suppressed domestic protests that became violent and turned into an anti-regime movement in Iran. Second, Iran was believed to supply drones to Russia, whether before or after February 24, that were used on the battlefield in Ukraine. The logic of compartmentalization did not work for the JCPOA.



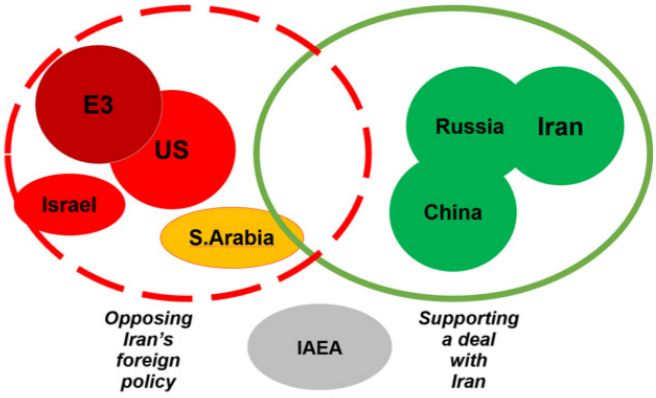
Nuclear diplomacy with Iran (2022-2023)

However, after the public statements by the US and European officials that the JCPOA was no longer on agenda, the United States continued non-public talks with the Iranians on the exchange of five detainees on each side. Switzerland, Qatar, Oman, Iraq, and some other countries were involved until the two agreed on a solution in the summer of 2023. The agreement was called *an understanding* and was not put on paper. Otherwise, it would have to be approved by the US Congress under the Iran Nuclear Agreement Review Act (INARA Act) that was adopted in the Obama times. Apart from the prisoners exchange, South Korean banks released six billion dollars to Iran. The money was transferred to a bank in Qatar, where Iran could have access to the money with the approval of the United States and no violation of its sanctions.

The understanding was no substitute for the JCPOA. It was an understanding that the US and Iran could make small reciprocal steps to overcome the deadlock. But in October 2023, the Israeli-Palestinian conflict erupted with a new wave of violence: Iran and the United States supported the opposite parties, which postponed any progress on the revival of the JCPOA.

DANGEROUS ABSENCE OF A DEAL

The JCPOA is currently in force only in legal terms, but no party is fully abiding by the agreement. The situation is often called *no deal, no crisis*, but amid multiple conflicts and crises in the region it can hardly last for too long.



State of affairs as of October 2023

As for the other actors, Russia currently is developing a close cooperation with Iran. China is the trading partner number one for

Iran. Saudi Arabia is marked in yellow because it restored the diplomatic relationship with Iran.

The new round of escalation between Israel and Palestine creates a dangerous situation in which Iran is interested in supporting Palestinians, and Israel is waging its own military operation in Gaza. And potentially, those hostilities could spread around other countries of the region as well.

This leads to a greater risk of military confrontation between Israel and Iran, as well as the proxy forces that are considered either pro-Iranian or at least receiving some support from Iran. The risky part in terms of Iran's nuclear program is that if a direct conflict between Israel and Iran erupts in the region and would directly affect the security of the two states, then there is a greater risk that Iran would accelerate the development of its nuclear program.

At least nine questions can be posed to consider negative scenarios around Iran's nuclear program[52].

- What impact could a direct military conflict between Iran and its adversaries like Israel have on the security in the region and beyond, as well as on intertwining character of international economy with the Hormuz Strait being the communication line for those who are exporting or importing oil and gas resources? Any conflict in the region, like a new tanker war, like the seizure of those tankers, the closure of the Strait, would cause destabilization not only in terms of the regional security but also international economy, and would disrupt the oil prices.

- If Iran feels compelled to leave the NPT, would the P5 countries react unanimously? We know that in some cases like the DPRK, India, Pakistan or Israel the nuclear-weapon states had different reactions to the development of nuclear weapons. Russia and China have more empathy towards Iran and positive bilateral relations. The United States, France and UK have the opposite attitude on Iran. Would that affect their ability to come to a joint reaction or to a joint decision in support of the NPT? What would happen and how would that affect the situation?

- Should Iran take a step further and develop a nuclear weapon, what will happen to Iranian fatwas prohibiting weapons of mass destruction (WMD)? Would the fatwa be revisited only in terms of the prohibition of nuclear weapons or that would affect the policies on chemical and biological weapons as well?

- Should Iran develop a nuclear weapon, what is the risk that it could use those weapons against its adversaries in a direct military confrontation rather than just use it as a deterrence?

- How clear could Iran's nuclear doctrine be and how long would it take Iran to develop its nuclear policy? The DPRK developed its nuclear weapons in the mid-2000s and only recently elaborated on its nuclear doctrine. Where would Iran find a balance between the ambiguity and clarity of its doctrine?

[52] Find more: Margoev A., Tokarev A., Ravandi-Fadai L. False Choice Between a Pro-Russian and a Non-Nuclear Iran. Part II // Vostok-Oriens. Expected to be published in 2024.

- How secure might potential Iranian nuclear weapons be? Will any unauthorized access be possible? What are the protocols for securing nuclear command and control and communication systems? Would those be vulnerable to cyber efforts like the 2010 *Stuxnet* virus developed by the American and Israeli intelligence forces against the Iranian nuclear facilities? Would cyber weapons pose a risk to Iran's potential national command, control, communication and intelligence center (NC3I)?

- Will Iran's government or its scientists be prone to nuclear proliferation in case the country possesses nuclear weapons?

- Should Iran develop a nuclear weapon, will it cause a chain reaction in the region and lead to further proliferation? Saudi Arabian highest-ranking officials made several statements that in case Iran pursues a nuclear weapon, Saudi Arabia would follow suit.

- What will happen in case of a political regime change in Iran?

International community might have to find answers to these questions if it fails to address the current diplomatic challenges around Iran's nuclear program. Those who are in charge of Iran's nuclear dossier need to be reminded what they are responsible for, what they can do in order to prevent further regional escalation, and how to prevent negative scenarios that would push Iran to seek greater security through nuclear deterrence. ■

PAPER 10.

LONG TIME NOT BEING DENUCLEARIZED. THE NUCLEAR STATUS OF THE DPRK AND THE PROBLEM OF KOREAN PENINSULA DENUCLEARIZATION

Alexander Vorontsov

NUCLEAR PROGRAM OF THE DPRK: BACKGROUND AND ORIGINS

Despite the fact that all the major powers refuse to recognize the nuclear status of the DPRK, all the major military headquarters have already included the DPRK in their strategic equations as a state with nuclear capabilities.

The fact that the DPRK could acquire nuclear weapons was rather interesting and unexpected at the same time. It is a small and poor country; some experts view it as a backward and underdeveloped country. Yet, it succeeded in starting and developing its nuclear and missile program.

1945	–	Korean Peninsula has been divided into two parts where the DPRK and the Republic of Korea were founded in 1948.
1950-1953	–	Korean War took place and ended up with Korean Armistice Agreement.
1952	–	Atomic Energy Research Institute and the Academy of Sciences were established in North Korea.
1958	–	The US deployed nuclear weapons on the territory of South Korea.
1959	–	North Korea and the USSR signed a nuclear cooperation agreement.
1980s	–	North Korea constructed a gas-cooled, graphite-moderated nuclear reactor for plutonium production.
1985	–	North Korea joined the Nuclear Nonproliferation Treaty (NPT).

North Koreans themselves say that their motivation was grounded in the threat openly voiced by the US during the Korean War (1950-1953). It was very dramatic and very tragic, causing heavy losses. The US headed the coalition of powers that, in accordance with the decision of the UN Security Council (UN SC), joined the war and launched a large-scale offensive operation. They had gotten very close to the Chinese boarder by the autumn of 1950, which forced China to also join the war, and two million of its *volunteers* also engaged in fighting the US. The fight was quite successful. General Peng Dehuai, the commander of the Chinese volunteer corps, managed to defeat General Douglas MacArthur who headed the American and the allied forces. From mid-autumn of 1950 to the winter of 1951, a decisive counteroffensive of the Chinese forces on the Korean Peninsula took place, ushering in a retreat of the allied forces. The retreat was very dramatic. The Chinese and North-Korean forces managed to return the occupied territory and move further, but then Peng Dehuai decided to stop near the 38th parallel because his main task (as he was Chinese, not North-Korean) was to guaranty the security of the Chinese boarder, not to unify the Korean Peninsula. And he succeeded into doing it.

However, at that moment General MacArthur, taking into consideration the painful retreat as well as the circumstances and the low morale of the officials (some even claimed the US should leave the Korean Peninsula), demanded that US President Henry Truman (1945-1953) should use nuclear weapons against North-Korean and Chinese forces. He demanded it openly and insistently. Mr. Truman did not agree to his demands and instead dismissed him from his position. Yet, the threat of using nuclear weapons against North Korea was very tangible. Pyongyang was very concerned. Now North Korea remembers that moment, but it is not just propaganda. The concern at that moment was very strong, even among its population, because it was a very realistic scenario. Just five years earlier, the US had used nuclear weapons against neighboring Japan, and nothing would stop it from doing it again.

There are some interesting memories of the Russians who were in Pyongyang at that time. One of them was Mr. Tolstikov, a famous Russian specialist on Korea. In 1945, he participated in the liberation of Korea as a Soviet soldier, fighting Japanese troops. He was in Pyongyang as a journalist in 1952-1953, during the Korean War. He survived the bombings of the American aviation. Pyongyang was totally destroyed. Life was very difficult. The remaining population left the city fearing a nuclear bombing. Even when the threat faded and the government understood that President Truman had chosen not to use nuclear weapons, it was very difficult to convince the population. Many refused to return to Pyongyang. As Mr. Tolstikov recalled, one of the Pyongyang officials came up with an interesting initiative. Most buildings were destroyed at that moment; so, they started creating green areas, engaging in landscape gardening, planting trees and flowers. It did have the right effect. People understood that if the government was doing such work in the destroyed city, it meant that the nuclear threat indeed disappeared. So, it was not only about propaganda, but it was also a real threat, and it became an important part of the mentality of both North Korea's leadership, and its population.

During the Korean War the Atomic Energy Research Institute and the Academy of Sciences were established in North Korea, when most of the country was destroyed by US bombings. Of course, it was not by chance.

Then the country started to recover after the War. In the first decades the DPRK's economy was quite successful, with the Republic of Korea trailing behind till the early 1970s.

North Korea conducted a successful agriculture reform and industrialization, and pushed forward science and education. Many North-Korean students at that time studied in the Soviet Union in various fields, including nuclear physics. Of course, they studied peaceful nuclear physics, not military. Western countries often accuse the USSR of having helped North Korea to develop its nuclear program by educating its nuclear arms specialists. That is not true. Students from North Korea studied together with students from other countries, mostly socialist ones. In particular, they studied in the Joint Institute for Nuclear Research (JINR) in Dubna. They all studied in the same laboratories, with the same equipment and following the same programs. None of these countries developed its own nuclear weapon program.

The Joint Institute for Nuclear Research (JINR) is an international intergovernmental organization established through the Convention signed on 26 March 1956 by eleven founding states and registered with the United Nations on 1 February 1957. JINR is situated in Dubna city, the Moscow Region, the Russian Federation. JINR a world famous scientific centre that is a unique example of integration of fundamental theoretical and experimental research with development and application of the cutting edge technology and university education. The rating of JINR in the world scientific community is very high. JINR has at present 16 member states: Armenia, Azerbaijan, Belarus, Bulgaria, Cuba, Arab Republic of Egypt, Georgia, Kazakhstan, Democratic People's Republic of Korea, Moldova, Mongolia, Romania, Russia, Slovakia, Uzbekistan, and Vietnam. Participation of Germany, Hungary, Italy, the Republic of South Africa and Serbia in JINR activities is based on bilateral agreements signed on the governmental level. The supreme governing body of JINR is the Committee of Plenipotentiaries of the governments of all 16 member states.

Source: https://www.jinr.ru/about-en/

North Korea, on the other hand, felt sharply its vulnerability to the US with its nuclear weapons. This idea was deeply ingrained in the mentality of the North-Korean leadership.

Of course, at the time of the Cold War North Korea was an ally of the Soviet Union and China. In particular, in 1961 the DPRK concluded treaties on friendship, cooperation and mutual assistance first with Moscow, then with Beijing. They contained a military clause. Pyongyang cooperated with Moscow and Beijing, developing its military forces, which were engaged in cooperation and joint strategic thinking with Moscow and Beijing, but they were not controlled by them.

At that time, there was no sign of a nuclear weapon program in North Korea. The USSR and the DPRK cooperated in science, and, in 1965, the Soviet Union delivered a small 2 MW uranium research reactor to North Korea. In 1966, upon the insistence of the USSR, the reactor was placed under the guarantees of the IAEA.

In the early 1960s, Park Chung Hee (1963-1979) came to power in South Korea as a result of the military coup. South Korea started a very successful program of economic development. Park Chung Hee was an authoritarian leader and a convinced anticommunist, but he was rightly believed to be the *father* of South Korea's economic growth. Since the 1970s,

South Korea surpassed North Korea in terms of economy, becoming increasingly assertive and self-confident, developing, in particular, its military might.

Park Chung Hee started his own secret nuclear weapon program. He was quite close to success when the US learned about his activities. He was estimated to be just two years away from completing the program. The US applied severe pressure, but Park Chung Hee was reluctant to abandon the program. There are even some rumors that his assassination could have been caused by US' suspicions that he was secretly proceeding with his nuclear weapon program.

The fact that South Korea at some point was developing nuclear weapons, influenced North Korea's leadership and its strategic thinking. In 1982, the Central Intelligence Agency (CIA) of the US received some indirect evidence that North Korea might have started some preparations to develop its own nuclear weapon program, and even shared the information with the Soviet Union in order to stop it. However, the information was unreliable, and the Soviet Union did not agree to act together at that moment.

In 1962, the DPRK launched its own 5 MW graphite-gas reactor in Nyongbyon. It is the heart of North Korea's nuclear program. It was not an educational reactor. It was an industrial-level reactor to produce electricity, though at a small scale, or to produce material for future nuclear weapons. The Soviet Union was accused of having assisted in constructing it. It was not true. North Korea constructed the reactor on its own. It used open sources to find some specialized literature and made a copy of the obsolete English *Calder Hall* reactor, which Great Britain used in the 1950s and 1960s. So, North Korea studied open sources in detail to make an exact copy of this reactor.

Cooperation in the sphere of peaceful atomic energy with the Soviet Union, of course, developed. Sometimes the relations between the USSR and the DPRK were fine, sometimes they were rather cool. For example, Kim Il Sung, the founder and the first President of the DPRK (1972-1994), did not visit the Soviet Union for 20 years. However, in 1984, after a long hiatus, he paid a visit to the Soviet Union again. It was a period of warming in bilateral relations and very intensive negotiations. He arrived in the USSR by train and spent a long time in the Soviet Union. He had a lot of meetings and discussions which were aimed at boosting economic cooperation between the two countries. During his visit, he asked the Soviet Union to help con-

Nyongbyon Nuclear Scientific Research Center

Source: open data

struct a more sophisticated and more powerful nuclear reactor to develop North Korea's economy and address its problems with electricity. North Korea has always been very rich in mineral resources, but it does not have oil and gas at all. Therefore, as well as in the case of South Korea, Japan and some other countries, there is a strong demand for electricity, and especially for nuclear energy.

The Soviet Union promised to help, but its economy was based on planning, and there was a long line of countries for which the Soviet Union was constructing nuclear power plants (NPP). So, North Korea had to wait for nuclear reactors to be built first in Hungary, then in East Germany, etc. Construction of the NPP in North Korea could only start in five years. An agreement was signed, and some geological preparations were done, but that was all.

As the Soviet Union was one of the depositories of the Nuclear Nonproliferation Treaty and strongly supported the nuclear nonproliferation regime, it could cooperate in the nuclear domain only with those countries that had joined the NPT. So, under the pressure of the Soviet Union, in 1985, North Korea joined the NPT, but it did not agree to the IAEA safeguards, explaining that at that moment the United States still kept nuclear weapons in the Southern part of the Korean Peninsula. As we know, the United States deployed there about 1.000 tactical nuclear weapons after the Korean War, keeping them there for a long time.

However, the Soviet Union did not have enough time to construct this reactor. Only the geological work was done and the site for the future power plant was found. This was also important, taking into consideration the complicated geological and seismic situation on the Korean Peninsula. Then, as another intermediate step, a contract was signed that envisaged supplying fuel assemblies. A discussion on the type of reactors was in process. But the Soviet Union disappeared in 1991.

By the way, during the last years of the Soviet Union, when the Foreign Minister of the USSR Eduard Shevardnadze visited North Korea to announce that the Soviet Union had made the decision to establish diplomatic relations with the Republic of Korea, the DPRK was too disappointed, because previously Soviet leadership – general secretary of the Communist Party of the Soviet Union Mikhail Gorbachev (1985-1991) and Eduard Shevardnadze personally – had promised North Korea that they would develop cooperation with South Korea in various domains but without establishing diplomatic relations. The reaction of North Korea was rather emotional, and later Mr. Shevardnadze recalled that it was the most difficult negotiation in his life. Then North Korea said that the Soviet Union changed dramatically its political orientation, joining the camp of North Korea's enemies – South Korea and the United States, breaking its promises, etc. So, North Korea promised to react accordingly, enumerating possible steps. North Korea felt that it remained alone against the nuclear powers in the region, that is, the United States and its allies – South Korea and Japan, which stayed under the US nuclear umbrella. Therefore, North Korea would need to develop its own nuclear weapons. It was in 1990 when they first said it openly.

FIRST NUCLEAR CRISIS (1993-1994)

In 1991, after the collapse of the Soviet Union, the DPRK found itself in a strategically and geopolitically new situation. Kim Il Sung was still in power at that time. He was old yet ac-

tive and performed a dramatic reorientation of the country's domestic and foreign policy. The new legitimacy was found in Korean history and tradition. They recalled Confucian tradition and the old history of Korea – they argue that it is at least 3.000 years long, starting with Dangun, the legendary founder of the Korean nation, common for both North and South Korea, the Koreans had excellent, strong and famous states, they enjoyed a long tradition of statehood. So, they rejected the American westernization culture, arguing that they had their own history, which was much richer and much more ancient.

Regarding foreign policy, Kim Il Sung said he was ready to improve relations with the United States, Japan and South Korea, saying they were not eternal enemies and should look from another perspective. As for the nuclear program, Kim Il Sung at that moment signed a safeguards agreement with the IAEA. At the same time, US President George H.W. Bush (1989-1993) withdrew US tactical nuclear weapons from South Korea. The argument used by the North-Koreans disappeared.

1991	–	The US withdrew its last nuclear weapons from South Korea.
1992	–	Joint Declaration of the Denuclearization of the Korean Peninsula.
1993-1994	–	Conflict between North Korea and the IAEA. First nuclear crisis on Korean Peninsula.
1994	–	Agreed Framework between the US and the DPRK.

The IAEA swiftly sent about six missions aiming to inspect the DPRK's nuclear sites, primarily the reactor in Nyongbyon. The inspectors found some violations of the protocol to the safeguards agreement and concluded that some fuel was produced in the reactor but was not reported. It became the source of suspicions that North Korea was developing a nuclear weapon program, which North Korea denied. The United States provided a satellite photo as a proof. It was the beginning of the first nuclear crisis on the Korean Peninsula 1993-1994.

Under pressure from the United States, the IAEA began to demand that North Korea should allow special inspections. The difference between routine and special inspections is very important as during routine inspections inspectors visit the facilities reported by the country while special inspections allow inspectors to visit any facility they want. North Korea rejected the demand, saying that it was a US-orchestrated reconnaissance attempt, not an IAEA inspection. So, they did not allow the Agency inspectors to enter the country and study their military capabilities.

Then, US President Bill Clinton (1993-2001) decided to act preemptively and destroy the Nyongbyon nuclear facility. It was clear, however, that North Korea would retaliate, ushering in a second large-scale Korean war.

The decision was made, and American troops began to concentrate on the Korean Peninsula. Five aircraft carrier groups were moving to the Korean Peninsula as well as American troops from different parts of the world, including the US territory. However, concentrating a large group of military forces required considerable time, and during that time

the Pentagon modelled and evaluated this war scenario, including eventual losses of both sides. The conclusion was that the United States and its allies would win, but the losses would be huge, amounting to millions of citizens and soldiers. And most importantly, the losses among the US military personnel would amount to between 50.000 and 100.000 people. Such losses were viewed as unacceptable. That was why a *Plan B* was chosen.

Talks between James Carter and Kim Il Sung in 1994

Source: open data

It should be recognized that American diplomacy demonstrated a considerable flexibility and creativity at that time. In June 1994, James Carter, the former US President (1977-1981), visited North Korea as a special envoy of President Clinton. Together with Kim Il Sung he had long negotiations, which turned out to be very successful. James Carter later recalled that though Kim Il Sung was 82 years old then, he was very dynamic, had good memory and knew all the details about the country's nuclear and military programs.

The talks were successful. Two weeks after the meeting, on July 8, 1994, Kim Il Sung unexpectedly died of a heart attack, but negotiations continued. In October 1994, a very important agreement, the *Agreed Framework*, was signed between the DPRK and the United States.

By the way, at that time Kim Jong Il (1997-2011), the son of Kim Il Sung, was not yet a formal leader of North Korea. It caused many rumors, and claims were making that the reason was that he was not cute, not clever, he was ill and weak, or that there was some political struggle inside North Korea. Later Western countries understood that Kim Jong Il had dedicated three years to mourning for his late father, as required by the Confucian tradition. That was the reason he did not occupy any official position, nor visit another country, nor accept foreign guests. His behavior was very humble. However, in October 1994, the Agreed Framework was signed, and Mr. Clinton sent a very polite personal letter to Kim Jong Il, wherein he promised to abide by the agreement if North Korea also followed its terms and conditions.

According to the agreement, North Korea had to freeze its Nyongbyon reactor because it was the only North Korea's reactor that could produce nuclear weapons material. Mr. Hans Blix, who was at that time the head of the IAEA, said that he could not guarantee North Korea was not producing nuclear weapons using that material. Anyway, the Nyongbyon reactor was closed under the oversight of the IAEA inspectors, mostly Americans. Those American diplomats lived near the reactor and every day they visited it. It was sealed, and cameras were established to monitor the regime of closing 24 hours a day under the reliable procedure of monitoring and verification.

1) In accordance with the October 20, 1994 letter of assurance from the US President, the US will undertake to make arrangements for the provision to the DPRK of a LWR project with a total generating capacity of approximately 2.000 MW(E) by a target date of 2003 ...

2) In accordance with the October 20, 1994 letter of assurance from the US President, the US, representing the consortium, will make arrangements to offset the energy foregone due to the freeze of the DPRK's graphite – moderated reactors and related facilities, pending completion of the first LWR unit...

3) Upon receipt of US assurances for the provision of LWR's and for arrangements for interim energy alternatives, the DPRK will freeze its graphite – moderated reactors and related facilities and will eventually dismantle these reactors and related facilities...

4) As soon as possible after the date of this document, US and DPRK experts will hold two sets of experts talks...

II. The two sides will move toward full normalization of political and economic relations...

III. Both sides will work together for peace and security on a nuclear – free Korean Peninsula...

IV. Both sides will work together to strengthen the international nuclear non-proliferation regime.

1) The DPRK will remain a party to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) and will allow implementation of its Safeguards Agreement under the Treaty.

2) Upon conclusion of the supply contract for the provision of the LWR project, ad hoc and routine inspections will resume under the DPRK's Safeguards Agreement with the IAEA with respect to the facilities not subject to the freeze. Pending conclusion of the supply contract, inspections required by the IAEA for the continuity of safeguards will continue at the facilities not subject to the freeze.

3) When a significant portion of the LWR project is completed, but before delivery of key nuclear components, the DPRK will come into full compliance with its Safeguards Agreement with the IAEA (INFCIRC/403), including taking all steps that may be deemed necessary by the IAEA, following consultations with the Agency with regard to verifying the accuracy and completeness of the DPRK's initial report on all nuclear material in the DPRK"|.

Agreed Framework of 21 October 1994 between the United States of America and the Democratic People's Republic of Korea
October 21, 1994

Source: https://www.iaea.org/sites/default/files/publications/documents/infcircs/1994/infcirc457.pdf

As North Korea lost its source of energy, the United States promised to provide 500.000 tons of fuel every year to compensate this energy loss, and to participate in the creation of an international consortium to construct two light-water reactors in North Korea, which was expected to become operational in 2003. Those reactors were expected to be much more powerful than the Nyongbyon reactor, amounting to 100 MW each. So, the negotia-

tion process and cooperation started. Of course, it was difficult because of very different mentalities.

> *North Korea is a very specific country. I personally met many American officials who were engaged in this process, for example, Bob Gallucci who headed the American part of the negotiation team, as well as many others. They communicated with the North Korean counterparts on a permanent basis and obtained very important experience which was very close to the experience of those Soviet experts who dealt with North Korea. For example, I remember as a young diplomat that it was very difficult to deal with the North Koreans. They were very different people. Our senior diplomats repeated that if you apply patience, you will start to understand them, and they will also understand you if you demonstrate patience.*
>
> *As we know, Americans are very impatient. They want to do everything quickly, and I remember having met Chuck Cartman in Hawaii. He was the man who headed KEDO – the Korean Energy Development Organization, a consortium consisting of many countries under the supervision and leadership of the United States that joined their forces to construct these two light-water reactors for the DPRK. By the way, Russia did not participate in the consortium. So, I delivered a speech in the Asia-Pacific Center for Security Studies in Hawaii. Mr. Cartman was also there, and he said patience was needed when dealing with North Korea. After the speech I told him privately that he was the first American I had met who pronounced this very important thesis that patience was important for dealing with North Korea. We understood each other very easily. In 1990s, American diplomats demonstrated such patience".*
>
> **Alexander Vorontsov**

The team of American diplomats who dealt with the DPRK in 1990s, were very professional, and mutual understanding gradually began to rise between the two countries. The construction of the LWRs started; relations gradually developed. It was not easy, and it was not quick. There were problems, but it was a period of tangible cooperation between North Korea and the West. Most participants of KEDO were in fact Western countries. However, as the year 2003 was approaching, there was nothing, but groundwork done at the sight of this future nuclear reactor. Besides, there were many differences in approaches towards the DPRK among the members of the Democratic and Republican parties in the US.

In 2000-2001, the United States and North Korea were close to establishing diplomatic relations. It was in fact the primary goal of North Korea to establish diplomatic relations with the United States, in hopes that the US would treat North Korea as a *normal* state. Previously, North Korea's leaders visited only friendly countries due to security reasons as state leaders occupy an extremely important place in the country's political system. But the second person in North Korea's leadership, the country's Vice-Marshal Cho Myong Rok visited Washington in October 2000. He was accepted by President Clinton in the White House, and they signed some documents. Soon after that, US Secretary of State Madeleine Albright visited Pyongyang in 2000 and spent a total of nine hours in direct talks with Kim Jong Il. In those days anti-American propaganda decreased dramatically in the mass media of North Korea. America began to be presented in newspapers almost as a friendly country, which was absolutely unbelievable. Mr. Clinton himself was expected to visit North Korea in late 2000 to establish diplomatic relations.

> *Later, when I visited the United States, including Washington DC and the Brookings Institution, I had a lot of interesting discussions with American diplomats who told me that at that time the US State Department was preparing the staff for the US Embassy in North Korea".*
>
> **Alexander Vorontsov**

Unfortunately, from the perspective of the nuclear issue and the security situation on the Korean Peninsula, the time was not ripe yet. It was the very end of the second term of President Clinton. He failed to visit North Korea, and then George W. Bush (2001-2009) came to power. He headed the Republican Party with a totally different agenda. At first it was unofficially called ABC – *All But Clinton*. Everything the Democrats, and personally Mr. Clinton did, was considered wrong. Changes were believed to be necessary. The same applied to this big deal with North Korea. The Republicans argued: "North Korea can produce nuclear weapons? Never! It is a bluff! They are underdeveloped, they have no capabilities! They tricked us! They have involved us in this trap! We paid a lot! And for what? For nothing!". By the way, the price of the KEDO project was 4 billion dollars, and it was paid mostly by South Korea and Japan, with other countries contributing only a small portion.

It was a very different and a hostile approach by the new presidential administration of the US. In the early months of 2002, George Bush announced the so-called *Axis of Evil*, which included three countries: Iraq, Iran and North Korea. The invasion of Iraq started soon in 2003. It was a large-scale invasion which resulted in the ousting of Iraqi President Saddam Hussein (1979-2003) and the total destruction of the Iraqi political regime. The situation was troublesome, and, in October 2002, Assistant Secretary of State James Kelly and the US State Secretary visited North Korea and accused it of tricking the US by stopping the plutonium reactor only to proceed with another secret nuclear program based on enriching uranium.

> *The negotiations were very tough. The DPRK officials answered that due to the hostile policy of the United States and the direct threat, North Korea had the right to develop its nuclear program. That was how the American side reported it, claiming the North-Koreans said: "Yes, we did it, we developed nuclear weapons program". North Korea answered a couple of weeks later: "No, we didn't say so. We said that we had the right and we had the capability to create a nuclear bomb, but we did not do it and we did not say we did it". It was a very interesting story. Maybe it was a mistake of an interpreter, maybe it was done on purpose… I was in the US in 2005 to participate in a conference in Seattle. Mr. Kelly, who had retired by that time, was also there. I asked him about these details after the conference, and he agreed: "Yes, at that time we did not have a reliable interpreter".*
>
> **Alexander Vorontsov**

So, this was the mainstream of the Republican administration. They did not want to follow the 1994 Agreed Framework, the legacy of the Democratic administration. However, it was signed by President of the United States, and some reasons were needed to abandon it. And they found them. The new American officials left the agreement in November, announcing that due to North Korea's violations the US stopped fuel shipments to North Korea. North Korea, for its term, promised to leave the NPT.

SECOND NUCLEAR CRISIS (2002-2003)

During the first North Korean nuclear crisis the country also announced that it would withdraw from the NPT, but according to the procedures, the decision can take effect only 90 days after the declaration. And on the last day of this period, North Korea said it interrupted its withdrawal procedure. Then, during the second North Korea's crisis, they withdrew completely, saying that the United States violated its obligations as two light-water reactors were not constructed, while the US engaged in a hostile policy and direct threats towards the DPRK. So, the DPRK declared it would develop its own nuclear weapons. It was said openly. The situation was very concerning, as the military invasion of one of the countries of the *Axis of Evil*, i.e. Iraq, was launched at that time, and the US was choosing the next victim. It could be Iran or North Korea. Of course, North Korea was also calculating this possibility.

2002	–	North Korea was characterized together with Iran and Iraq as the Axis of Evil by American President George W. Bush.
2002-2003	–	Second nuclear crisis on Korean Peninsula.
2003	–	North Korea withdrew from the Nuclear Nonproliferation Treaty based on the Article X.
2003-2009	–	Six-Party talks: China, Japan, North Korea, Soth Korea, Russia, the US.
2006	–	North Korea declared that it had performed its first-ever nuclear weapon test.
2009	–	North Korea conducted a second nuclear test.

At that moment, Russian diplomacy demonstrated initiative and creativity. The DPRK announced its withdrawal from the NPT in late December 1992. Three weeks after, in January, the Deputy Foreign Minister of the Russian Federation Alexander Losyukov visited North Korea as a special envoy of President Vladimir Putin (2000-2008; 2012-present). He also brought a draft agreement.

> *Recently I've had an opportunity to meet him [Alexander Losyukov] when he served as Russian Ambassador to Japan. We met at an international conference in Tokyo, and I asked him about that episode. He said it was not easy, because it was emotional, and the military commander of North Korea, Vice-Marshal Cho Myong Rok, the very same person who had earlier visited Washington, claimed that all the military personnel of the North Korean army is ready to fight the Americans and to die, if necessary, in order to protect the country and destroy the US forces. Mr. Losyukov told him: "Mr. General, please, wait for a moment. Before you go to the front line to die as a hero, please give us, diplomats, a chance to do our job. Maybe we will succeed".*
>
> **Alexander Vorontsov**

At that moment George W. Bush repeatedly argued that he would never meet with North Korean leaders because they had violated the previous agreement, and new meetings with them would encourage them in their bad behavior. The situation was dangerous, and Mr. Losyukov came up with the idea to make it possible for North Korea and America to meet in a broader format. It was an example of a package formula. Nevertheless, North Korea at that time said it did not need mediators as the 1994 Agreed Framework was a bilateral agreement between the DPRK and the US. They wanted direct talks with the US. The United States at that time did not want to communicate with North Korea, but it took some elements of that package proposal and used its key elements. Of course, Russia was not the only country that proposed *package deals*. So, in autumn 2003, Six-Party talks started. It was regarded as an umbrella format which allowed the United States and North Korea to meet each other at the negotiating table within a larger format that included the China, Japan, Russia, United States, and the two Koreas.

Within the framework of these Six-Party talks which lasted from 2003 to 2009, comprising many meetings on the level of foreign ministers and deputy foreign ministers and leading to a very important experience, there was success to a certain extent.

The United States started from the proposal of CVID, which meant *Complete, Verified and Irreversible Dismantlement*. Its position was very tough: first North Korea should dismantle all nuclear facilities under international control, so that nothing would remain in the country that would allow it to develop nuclear technologies. Only after that the US would be ready to discuss North Korea's security concerns and how to deal with them, how to give security guarantees, etc. It was unacceptable to North Korea. They flatly rejected this initiative. By the way, the American side insisted that in the future nothing connected with nuclear technology should remain in North Korea. It was a direct violation of the NPT, which guarantees to all countries that they have the right to develop peaceful nuclear program and get assistance for that. In the end, America had to adjust its approach.

The Six-Party talks process started quite intensively. Important success was achieved with the joint statement of September 19, 2005, at the fourth Six-Party talks meeting. The American side accepted the proposal of North Korea supported by Russia and China, that the movement should be parallel, with simultaneous steps from both sides. The principal *commitment for commitment, action for action* was accepted, and North Korea agreed that the final result of this Six-Party talks should be the nuclearization of the Korean Peninsula. By the way, Russia and China introduced the idea that it should be denuclearization under the international control of not only North Korea, but the whole Korean Peninsula, including South Korea, where some experiments with nuclear weapon technologies were conducted by the US and the Republic of Korea, though they were rather limited at that time.

During the second term of the Republican administration of George W. Bush, the US became much more flexible, accepting some North Korea's arguments. The Six-Party talks included both joint and bilateral meetings. The bilateral track between the United States and the DPRK was at first very limited and formal. Yet, later it gained momentum and started to prevail over the Six-Party talks.

Upon the demand of other participants, North Korea presented a declaration on its nuclear activities. It was an important document that set forth its commitments to the United States reached within the margins of the Six-Party talks.

The progress was considerable, but there were many difficulties as well. One reason was the contradictory approach within the American leadership. The US State Department was very keen to push forward the Six-Party talks, but other political groups asked what the result would be. They did not want to recognize North Korea as a *normal* state. There was a very strong anti-Korean mood in the US Congress and among conservatives, who actively tried to hinder this process. So, while the US State Department sincerely tried to do its best to facilitate the diplomatic process, the US Department of the Treasury initiated a campaign of seizing North Korea's accounts in foreign banks. The *Banco Delta Asia* in Macau became particularly famous in this regard as North Korea's money there was seized. North Korea said: "Sorry, you violate your promises. On the one hand, you call for our denuclearization claiming you are a friendly state, but on the other hand, you conduct very hostile actions". The crisis was overcome in the end, but it took a lot of time and effort invested by the US State Department.

At that time, to encourage North Korea to move further, the United States excluded North Korea from the American list of state sponsors of international terrorist. Japan was very angry, and the head of the American delegation told us that at that moment Japan, not North Korea, was the main problem for the US. Japan asked: "How could you exclude North Korea from the terrorist list?". In fact, the main reason of Japanese participation in the Six-Party talks was not the nuclear problem, but the abductee issue, i.e., the fate of the Japanese who had been abducted by North Koreans many years before. It was a very important issue, but it was different, it was not international, unlike the nuclear problem which directly affected the international nonproliferation regime.

So, there were many difficulties. Finally, in 2009 the Six-Party talks stopped. Earlier, in 2006, North Korea conducted the first nuclear test. In 2009, there was the second nuclear test, and the situation began to develop in another direction.

NUCLEAR PROGRAM OF THE DPRK: CURRENT STATE OF AFFAIRS

When the Six-Party talks collapsed, they were already at the second stage, and some tangible progress had been achieved. It was agreed that there would be a third stage, which was expected to be very important and to embrace the issue of the verification of North Korea's nuclear weapons. However, at that moment South Korea also changed its attitude as the Conservative party came to power. The new President of South Korea, Lee Myung-bak (2008-2013), tried to speed up the process, supported by some American counterparts. They said that they should verify everything right now. In return, North Korea answered that it was a violation of the agreements, as verification was envisaged at the next stage.

The efforts, made primarily by Russia and China, to find a way to preserve the format continued. In 2011, 2012 and in 2013, North Korea even agreed to return to the Six-Party talks. Meanwhile, inter-Korean relations became to deteriorate. There were a number of incidents, even some local clashes, between the North and the South, which influenced negatively the situation.

Kim Jong Il passed away in 2011. His young son Kim Jong Un (2011-present), the third leader of North Korea, who is still in power, succeeded him. Kim Jong Un promised his country to develop nuclear weapons, while raising simultaneously the living standards of the population. He conducted some successful economic reforms in North Korea, but the

situation in the international arena was unstable. In 2013, there was again a security crisis on the Korean Peninsula caused by large-scale joint military drills in South Korea with the US participation, which North Korea viewed as a threat. North Korea proceeded with its missile program. In 2012, at the third attempt it succeeded in launching a satellite. It was heavily criticized by other countries. In 2013, North Korea withdrew from 1953 Korean Armistice Agreement.

2009	–	North Korea walked out of Six-Party talks.
2012	–	Leap Day Deal between the US and North Korea.
2013	–	North Korea conducted a third nuclear test.
2013	–	North Korea withdrew from Korean Armistice Agreement.
2016	–	North Korea conducted fourth and fifth nuclear tests.
2017	–	North Korea conducted a sixth nuclear test. It was a thermonuclear test.
2017-2020	–	Several circles of talks between the US under Donald Trump and North Korea under Kim Jong Un including three official summits.
2018-2019	–	Korean peace process.
2023	–	Washington Declaration between the US and South Korea.

Then, North Korea continued to develop its missile and nuclear programs. In 2013, it conducted its third nuclear test, in January 2016 – its fourth nuclear test. At first, it conducted one test in three years, but then it accelerated the process. In September 2016, it conducted its fifth nuclear test, and the sixth took place in September 2017. North Korea managed to develop both plutonium and uranium programs and to make them more sophisticated.

In fact, cooperation with the United States during the Six-Party talks and later was quite tangible. There was indeed some fruitful interaction which demonstrated the possibility of a diplomatic solution for the Korean nuclear problem. Unfortunately, the negotiation process was repeatedly interrupted by some negative factors. First the 1994 Agreed Framework was violated, then the Six-Party talks were stopped.

Quite surprisingly, another tangible and very promising attempt was undertaken by US President Donald Trump (2017-2021). In 2017, a dramatic escalation on the Korean Peninsula took place. North Korea conducted a thermonuclear test, demonstrating the progress achieved in its nuclear capabilities. A test of an intercontinental ballistic missile (ICBM) was conducted as well. For a long time, the US had underestimated the capabilities of North Korea in producing sophisticated missiles. At that moment, the US had to recognize that North Korea's missiles could reach the continental American territory. In early 2017, President Trump argued that he could use nuclear weapons to destroy North Korea. He issued some very impolite statements addressing Kim Jong Un.

Very soon the US switched to a negotiation scenario. The parties managed to achieve a gentleman's agreement. The United States promised to stop large-scale joint military drills with South Korea, while North Korea promised to stop nuclear weapons and ICBMs tests. While Donald Trump was in power, the agreement was respected by both sides.

> ***Will someone from his depleted and food starved regime please inform him that I too have a Nuclear Button, but it is a much bigger & more powerful one than his, and my Button works!".***
> ***"Soldiers are dangerously fleeing to South Korea. Rocket man now wants to talk to South Korea for first time. Perhaps that is good news, perhaps not – we will see!".***

Some tweets of Donald Trump about Kim Jong Un
2018
Source: https://www.theguardian.com/us-news/2018/jan/03/donald-trump-boasts-nuclear-button-bigger-kim-jong-un

It was a period when the world saw the first direct US-DPRK summit. Donald Trump and Kim Jong Un met three times. First, they met in Singapore in June 2018. The meeting was successful, and the parties promised to stop the conflict and to start a new type of relations. But this first meeting was mostly declarative in nature. In February 2019, they met in Hanoi, Vietnam, for serious negotiations, during which North Korea said it was ready to

2018 DPRK-US Singapore Summit
Source: open data

2019 DPRK-US Hanoi Summit
Source: open data

2019 DPRK-US DMZ Summit
Source: open data

destroy the Nyongbyon reactor in exchange for the US removing most international sanctions imposed on North Korea for its nuclear and ICMB tests under the respective UN Security Council resolution. In June 2019, the two leaders met in the demilitarized zone in Panmunjom, which has divided North and South Koreas since 1953.

FOOD FOR THOUGHT

Talks were hard, and after all the United States rejected this proposal under strong influence of conservatives. Anti-North Korea sentiment was too strong in the US, preventing Donald Trump from signing any new agreement. North Korea's leader was deeply disappointed after the meeting in Hanoi. The official negotiation process with the United States never fully restarted, but while Mr. Trump was in office, their gentleman's agreement remained in force, and the two leaders exchanged personal letters. It was like during the period of the 1994 Agreed Framework, when the environment was very secure, calm and rather positive. Military tensions decreased considerably.

But Mr. Trump failed to be reelected in 2021. The Democratic administration of Joe Biden (2021-present) chose a totally different approach. Officially, they said they were ready to meet at any place at any time without any preconditions, but it was not clear what should be discussed. The Democratic presidential administration returned to the formula of CVID, which was rejected by North Korea many times.

At that time the US had no serious intention of engaging in practical negotiations with North Korea. North Korea waited for one year, continuing to fulfill its voluntary moratorium on nuclear and ICBM tests. However, ultimately, North Korea concluded that Biden's policy was absolutely different from Trump's, that it was very hostile towards North Korea and that North Korea needed to actively develop its nuclear program because it is only one means to ensure its survival, taking into consideration the experience of Libya, Yugoslavia, Iraq, the attempt to overthrow the Syrian regime, etc.

So, North Korea started a new dynamic stage of active missile tests. It managed to produce various types of ballistic missiles, first on liquid fuel, then recently they have succeeded in producing solid-fuel missiles. Additionally, they have developed railroad and underwater launchers, cruise missiles, and right now North Korea is working on hypersonic technology.

The situation began to deteriorate very rapidly, and now the tensions around North Korea are very high again. North Korea has made some steps towards proclaiming itself a nuclear power. In 2013, it included in its Constitution the clause that North Korea was proclaimed a nuclear state, so its nuclear status was legitimized[53]. It was not yet a nuclear doctrine, it was just a very short clause. Then, in September 2022, they adopted the law that proclaims their right to use nuclear weapons. The law is very detailed, all types of nuclear weapons are described, and all the conditions in which such weapons could be used are stated in detail. It is declared that they can use them if they feel an imminent existential threat to North Korea, stating the right to a preemptive strike.

The deterioration, unfortunately, has accelerated. North Korea proceeded with advancing its nuclear capabilities. In September 2023, it adopted an amendment to the Constitu-

[53] Find more: Asmolov K. North Korea's Nuclear Potential // Valdai Discussion Club, February 5, 2024.

tion, adding the right to speed up nuclear weapons development[54]. They say they can use tactical nuclear weapons against American military facilities in South Korea and around the Korean Peninsula, which means they could hit Japan, Guam, etc.

Unfortunately, as of today, there is no line of direct communication, at least officially, and no negotiation process. South Korea also has a very strong desire to produce its own nuclear weapon. To this point, the United States has succeeded to manage this situation. In January 2023, President of the Republic of Korea Yoon Suk Yeol (2022-present) said for the first time in history that the situation was developing in a dangerous direction and that South Korea's officials were considering the possibility of producing nuclear weapons.

> ***President Yoon Suk Yeol of South Korea said for the first time on Wednesday [January 11, 2023] that if North Korea's nuclear threat grows, South Korea would consider building nuclear weapons of its own or ask the United States to redeploy them on the Korean Peninsula. Speaking during a joint policy briefing by his defense and foreign ministries on Wednesday, Mr. Yoon was quick to add that building nuclear weapons was not yet an official policy. He stressed that South Korea would for now deal with North Korea's nuclear threat by strengthening its alliance with the United States. Such a policy includes finding ways to increase the reliability of Washington's commitment to protect its ally with all of its defense capabilities, including nuclear weapons. Mr. Yoon's comments marked the first time since the United States withdrew all of its nuclear weapons from the South in 1991... "It's possible that the problem gets worse and our country will introduce tactical nuclear weapons or build them on our own...If that's the case, we can have our own nuclear weapons pretty quickly, given our scientific and technological capabilities". Calls for nuclear weapons have bubbled up in South Korea over the decades, but they have never gained traction beyond the occasional analysts and right-wing politicians".***
>
> **The New York Times**
> **January 11, 2023**
> *Source:https://www.nytimes.com/2023/01/12/world/asia/south-korea-nuclear-weapons.html*

In April 2023, Yoon Suk Yeol visited Washington, and after the negotiations with Joe Biden, he said that he respected the NPT and believed in the extended deterrence, the United States provided for South Korea. Therefore, South Korea would remain a non-nuclear-weapon state.

However, the situation is flexible. The United States has begun to deploy its strategic assets and nuclear weapon carriers in the region, including having aircraft beginning to visit South Korea more and more frequently. Of course, it also contributes to rising tensions and undermines the possibility to resolve the nuclear problem of the Korean Peninsula by diplomatic means.

Yet, history demonstrates that there have been some periods of very productive negotiations that could lead to denuclearization of the Korean Peninsula. Undoubtedly, North Korea is a country with which one can, indeed, negotiate. The DPRK has demonstrated its readiness to equal negotiation. As for today, the situation as for today is negative, unfortunately, but some positive experiences in history give a hope that there is still a chance to resolve this issue. ■

[54] В конституцию КНДР внесли поправки об ускоренном развитии ядерных сил // ТАСС, 28 сентября 2023 г.

PAPER 11.

NEW STAGE OF PROLIFERATON: WHAT FACTORS DO CONTRIBUTE TO IT?

Sergey Semenov

It has become commonplace in international security discussions that the global nonproliferation architecture is in crisis. Yet, it is true. The nonproliferation regime, however useful it is, is not living through the best of its times.

Two consecutive Nonproliferation Treaty (NPT) Review Conferences, which took place in 2015 and in 2022, ended without a final document. In 2015, the reason for that was the situation in the Middle East, around the zone free of weapons of mass destruction (WMD) in the region. In 2022, the main obstacle to consensus was the Ukrainian crisis, and the attempts by some states of the *collective West* to impose their anti-Russian agenda on the NPT Review Conference. So, what tendencies can be identified in the realm of nonproliferation in the current stage of global affairs?

NONPROLIFERATION REGIME AT THE CURRENT STAGE: NEW TENDENCIES

▶ Firstly, it should be pointed out that the NPT is witnessing the *greatest level of politicization*. Nonproliferation is no longer seen as isolated from the global security crisis. It is now considered in a broader context of contradictions between major world powers: the United States, the Russian Federation, and the *collective West* as a whole. And previous understandings that nonproliferation should be a *silk thread* connecting the capitals, that nuclear threats are too serious to be linked to some extraneous issues is no longer present.

Examples of that are the last NPT review conferences, the general crisis of arms control in multilateral institutions and disarmament machinery for reasons which are not strictly nuclear. For example, in the previous NPT review cycle, the hottest debates were caused by the *Skripal incident*, by the use of chemical weapons in Syria, and by matters which were not related to nuclear disarmament. They were not nuclear in their essence.

Speaking about the current crisis in the present NPT review cycle, of course, the major obstacle is the Ukrainian crisis. Attempts are being made by the *collective West*, by its allies, to impose Ukraine-related agenda on the multilateral institutions and the NPT in particular. A curious moment in this regard is that the United States, one of the main architects of the NPT and of the global nuclear nonproliferation regime, is more constructive and is more willing to at least pretend that there is some mode of normality in the NPT than its European allies and Eastern European NATO members in particular. The culture

of compromise, the culture of diplomacy, the culture of trust, which previously were built by the founders of the NPT, has been lost.

▶ The second tendency to be noted is *the growing gap between nuclear-weapon states* and *non-nuclear-weapon states within the NPT framework*. It is not something new in discussions on nonproliferation.

Article VI of the NPT stipulates that parties to the Treaty would negotiate on the cessation of nuclear arms race and on nuclear disarmament in the context of general and complete disarmament. In recent years, those advocating for nuclear disarmament irrespective of the general security environment have become more assertive.

In 2017, the Treaty on the Prohibition of Nuclear Weapons (TPNW) was concluded. Since then, humanitarian considerations of nuclear-related issues have been attracting more and more attention in the NPT review cycle. But *anti-nuclear radicals*, states radically advocating for nuclear disarmament, regardless of concrete security environments, concrete situations in the relations between nuclear-weapon states are moving into propaganda mode. They create illusions that nuclear disarmament may be attained just through humanitarian considerations, humanitarian concerns.

▶ The third tendency is *growing attention towards the issues which were previously tacitly agreed upon in the NPT framework*. One of the major examples in this regard is the practice of NATO nuclear sharing. According to the US position, it was part of the nonproliferation deal in 1960s and it is inherent in the NPT, there is no violation in non-nuclear-weapon members of NATO having access to nuclear weapons, when NATO pilots from Poland, from the Netherlands, from Italy, from Germany are trained to employ nuclear weapons, nuclear assets in combat with other members of NATO being trained and equipped to support nuclear operations. This issue has become more acute. In 2014, it was one of the first times that modern Russia brought up this matter.

US Nuclear weapons in Europe (as of 2023).

© PIR Center

Source: open data

▶ Another tendency is not just about nonproliferation. It is about the international security architecture in general, in particular, the *erosion of multilateral institutions*. The NPT is only one example. Nonproliferation is about maintaining international peace and security. However, as much as one would like to keep matters apart to isolate nonproliferation from the *storms of reality*, it is not possible and its interconnection with arms control, nonproliferation and disarmament should be noted.

A disappointing trend that has been seen in the past eight years is the disappearance of treaties and institutions that previously were crucial to the fabric of international security. In the arms control domain, the 1987 Treaty on the Intermediate-Range Nuclear Forces (INF Treaty) was denounced in 2018 at the fault of the United States. We have seen the crisis around New START in the late years of the Donald Trump administration (2017-2021), and participation in the Treaty was suspended by Russia in 2023 due to the US sponsorship of Ukrainian attacks on Russian strategic facilities.

The same goes for the Comprehensive Nuclear-Test-Ban Treaty (CTBT), which was de-ratified by the Russian Federation in 2023 because of unfriendly US' policy towards Russia, and US' unwillingness to make progress in terms of the Treaty entering into force. In the multilateral milieu, there was the collapse of the Joint Comprehensive Plan of Action (JCPOA) on the Iranian nuclear program, prompted by US withdrawal and EU countries unreadiness and inability to uphold the nuclear deal.

For so long, there has been no progress in the Conference on Disarmament (CD), which is currently 20 years away from the agreed consensus-based program of work and agenda and which has evolved into merely a discussion forum where the most acute issues of today, say the prevention of arms race in outer space or the ban of acts of chemical and biological terrorism, are not moving forward.

Of course, this is not creating the best momentum for the NPT review cycle. In 2010, the situation was better. The negotiation of the New START between the Russian Federation and the United States created at least some positive environment to achieve progress and consensus in the NPT framework, and the Conference in that year ended with a consensus-based final document setting up concrete specific steps, measures to be implemented to advance nuclear nonproliferation, disarmament, and peaceful uses of nuclear energy.

Particularly disturbing are the attempts to limit access to nuclear technologies by imposing sanctions, inventing measures of unfair competition, creating preference for some certain suppliers in the nuclear energy market, citing proliferation concerns, and so on and so forth. This is also a factor which should be taken into account when discussing what is happening in nuclear proliferation.

By the way, there is a positive trend to be pointed out. Notwithstanding the crisis in the realm of nonproliferation and arms control, as well the crisis in international institutions, there is a discussion on how to overcome this impasse within the NPT, and one of the points of such a discussion is nuclear risk reduction. New coalitions on the matter formed, for instance, the Stockholm Initiative, which has put forward some specific measures in this regard. This is probably where the consensus might emerge. Indeed, for nuclear disarmament, for concrete steps on the cessation of nuclear arms race, there should be a specific environment that has to be created through confidence-building measures,

through dialogue, through exchange of opinions. Measures proposed by some non-nuclear weapon states as well as measures already implemented in the Nuclear Five milieu are a good sign that should be fostered and continued.

CONDITIONAL PROLIFERATION OF NUCLEAR WEAPONS IN THE US FOREIGN POLICY

Nonproliferation cannot be isolated from having a strategic effect on other institutions, treaties, and actions. One should pay attention to the general erosion and upcoming collapse of the American-led nuclear order and the US-centered architecture of security in Europe, East Asia, and in the Middle East.

When the NPT was negotiated, the Treaty was preceded by some agreements between the United States and its allies. Those agreements have been cemented by US extended deterrence. Since then, the United States has always posited that its extended deterrence obligations are beneficial for nuclear nonproliferation, that thanks to extended deterrence or nuclear sharing, non-nuclear weapon states allied with the US have no motivation to seek nuclear weapons or, to develop advanced nuclear capabilities and the sensitive parts of a nuclear fuel cycle.

> "For many in the United States, the preferred option would be the NPT in combination with the *European choice* (that is, with multilateral nuclear forces or some other mechanism for introducing nuclear weapons for the Western Germany and other non-nuclear NATO countries). But the firm course of the Soviet Union to conclude a treaty on a truly international basis, which was also supported by the majority of non-nuclear states, both in Europe and in the world as a whole, made it possible to work out a treaty on an equal foundation, at least as far as the relationship between the two nuclear powers went…
>
> The decision of the United States to conclude a treaty was in line with the American interest in preserving and projecting its influence on the world stage. This connection between nuclear nonproliferation and other American interests in the wider world was highlighted, in particular, by Walt Rostow, the US presidential aide for national security during the last stage of the Johnson administration. However, it is also true that not only some representatives of the American academic community (Kenneth Waltz, John Mearsheimer, etc.), but also some US officials have expressed considerations in favor of encouraging proliferation, in particular, with regard to, for example, Japan and India. Rusk also belonged to them at a certain stage. Their argument was extremely simple: "Why shouldn't our friends have nuclear weapons, whereas our enemies have them?".
>
> **Ambassador Roland Timerbaev**
> **Russia And Nuclear Nonproliferation, 1945-1968**
> **1999**
> *Source: https://pircenter.org/wp-content/uploads/2024/01/Russia-and-Nuclear-Nonproliferation-1945-1968.-Ch.-8.pdf*

During the Trump administration, the US faced the loss of confidence of the side of their allies in Washington's ability and Washington's willingness to defend them and to uphold the alliance established in the Cold War. Indeed, now the United States is making attempts to re-establish some sort of confidence that *Washington is still there*. But the more acute the international environment is, the more practical measures Washington will have

to put in its alliances to reassure its partners. A disturbing tendency that can be seen now is the practice of conditional proliferation through NATO nuclear sharing, AUKUS partnership, as well as the updating of extended deterrence with partners in East Asia.

Case № 1. Nuclear sharing within NATO alliance

The US nuclear weapons were deployed in Europe in the 1950s. Following that, several agreements were concluded between the United States and its NATO allies concerning management, storage, information exchanges on nuclear weapons deployed in the respective European countries.

One of the concepts of nuclear sharing in its upgraded version and its maximalist interpretation is the concept of Multilateral Nuclear Forces (MNF), which was put forward by the United States. Later it was rejected by the United States during the NPT negotiations in the 1960s. But it would be a mistake to regard nuclear sharing as some sort of downgraded version of the MNF, as in its current form, nuclear sharing was being implemented and was being structured regardless of the discussion on the MNF.

In 1957, measures were put in place on the sharing of data on nuclear weapons with the European partners. Specifically, it refers to nuclear weapons information which may be of use for doctrine, for planning or the use of forces in a military conflict. Besides, it is about training of NATO non-nuclear-weapon states servicemen to use nuclear weapons in the field of combat. Again, until the early 1960s, the notion of US control over nuclear weapons deployed in Europe was rather conditional because no permissive action links existed at that time, and any NATO servicemen would have used nuclear weapons without Washington's decision to do so. After the Cuban Missile Crisis in 1962, the situation was improved, and permissive action links were introduced but the matter of deployment, the matter of training non-nuclear-weapon states for actual employment of nuclear weapons capabilities persisted regardless of the course of the NPT negotiations. This process was grounded in 1967 when the Nuclear Policy Planning Group was established in NATO, and this mechanism still exists in order to coordinate nuclear weapons planning within NATO members, and for some time this was not an issue in the NPT-related discussions.

US diplomats now stipulate and posit that the Soviet Union gave explicit consent to this practice when negotiating the NPT, that the USSR specifically agreed that nuclear sharing would not be affected by the conclusion of the Treaty. The available archival materials do not prove this notion. During the NPT ratification process in the United States, Deputy Director of the Arms Control and Disarmament Agency Adrian Fisher declared to the US Senate that the Soviet Union could not be expected to agree to a practice which was kept in secret. Available records also show that Soviet representatives more than once made it clear that the Soviet Union would not be bound by unilateral interpretations of the deal.

In the NPT review process context, the issue of nuclear sharing is not something new, it was raised by the Non-Aligned Movement in 1980s, but it was silenced at that time. Russia, for its part, only turned back to the issue in 2014 during the new round of escalation of bilateral relations between Russia and the *collective West*, and it made clear that nuclear sharing was unacceptable. Indeed, in the Soviet times there was at least semblance of military parity between the two blocks: the US-led NATO and the USSR-led Warsaw Pact Organization. After the collapse of the USSR, the parity was destroyed, and the balance was inhibited.

The Russian Federation withdrew all of its tactical non-strategic nuclear weapons from abroad. They were moved to a non-operational status and located at central storage facilities. The United States did not follow suit. Still, there are around 200 American tactical nuclear weapons deployed in European non-nuclear-weapon states: Germany, the Netherlands, Belgium, Italy, Türkiye[55]. This military infrastructure, its modernization, and the use of updated versions of B61 gravity bombs create a tangible, real threat to the security interests of the Russian Federation. It is reasonable that Russia cannot be expected to be bound by the US interpretations of the NPT in this context.

For some time, Russia's counter actions were limited only to diplomatic declarations, statements in the NPT, making clear the Russian opposition to this practice. But then Poland declared in 2022 that it was ready to host US nuclear weapons on its territory[56]. This threat has become more palpable, not only for Russia but also for Belarus, given the complete destruction of their relations and dialogue with the *collective West*. It is quite reasonable and understandable that Minsk decided to approach Russia on the deployment of Russian nuclear weapons to defend the bodies, the security, the sovereignty of the Union State of Belarus and Russia.

President of the Republic of Belarus, Alexander Lukashenko, first discussed such a possibility in 2021. President Vladimir Putin, in 2022, made it clear that Russia was willing at least to provide some capabilities in this regard to its Belorussian partners, with its servicemen being trained for the service of *Iskander-M* tactical missiles. Its pilots began to be trained for nuclear missions, and its air fleet began to be upgraded for possible deployment of nuclear weapons. Yet, in 2022, no actual deployment took place. That was designed to be a signal to the Western opponents that their approaches in terms of deployment of nuclear weapons and in terms of their general Russophobic policy should be reconsidered. But it did not happen. The aggressive anti-Russian policy is still being pursued by the United States and by NATO members. And in this regard, Russia could not maintain the *status quo*. Some counterweight, some counterbalance should be thrown into the game. In 2023, it was declared, first in March, then in June, that Russian nuclear weapons would be deployed in Belarus.

> ***"As for our talks with Alexander Lukashenko, this decision was motivated by the statement of the British Deputy Defense Minister that Great Britain is going to supply depleted uranium munition to Ukraine, this is somehow connected with nuclear technologies... We do not transfer [nuclear weapons]. And the United States does not transfer them to its allies. We are basically doing the same things that the US has been doing for decades. They have allies in certain countries, the US prepare their means of delivery and their crews. We are going to do the same. This is exactly what Alexander Grigoryevich [Lukashenko] asked us for".***
>
> **Russian President Vladimir Putin in an interview for the TV-program Moscow. Kremlin. Putin 2023 (Unofficial translation)**
> *Source: https://smotrim.ru/video/2590587*

One might have the impression that Russia has just copied the US practice of nuclear sharing which, in its previous interpretations, it is also in non-compliance with its obligations under the NPT. But it should be noted that the practices are quite different. Regarding Russia,

[55] Путин сообщил о 200 хранящихся в Европе ядерных тактических боезарядах США // Интерфакс, 25 июня 2022 г.
[56] Качиньский заявил о готовности разместить ядерное оружие по просьбе США // РБК, 3 апреля 2022 г.

we are currently only talking about the storage of nuclear weapons, actual control over nuclear warheads or nuclear-gravity bombs is not transferred to our Belorussian partners. Also, there is a difference between the deployment of nuclear weapons thousands of km away from the national territory (case of the US) and the deployment of nuclear weapons within a common defense space of Russia and Belarus under the auspices of the Union State.

"The problem of establishing a nuclear weapon-free zone in Europe has remained unresolved for more than 70 years. With the start of the Russia's Special Military Operation in Ukraine, it makes sense to revive this long-forgotten idea. It looks quite reasonable, given the fact that one of the official reasons for the Operation was provided by the Ukrainian leadership's rather ambiguous statements about its nuclear ambitions, and against the background of the revival of discussions about the deployment of Western nuclear weapons in Poland and of the Russian ones in Belarus, i.e. in CEE [Central and Eastern Europe]. The idea of a nuclear weapon-free zone should not come to the fore during the negotiation process on Ukraine, nor be presented as the only silver bullet solution that can pacify CEE once and forever. Such an approach looks counterproductive due to the extreme radicalization of the foreign policy rhetoric of Eastern European countries that currently do not even want to hear anything about any negotiations with Putin's Russia. This mostly applies to Poland, the Czech Republic, Romania, and the Baltic countries, as without their participation the implementation of the NWFZ project in CEE does not make much sense. Despite all of the above, following the cessation of hostilities, the resolution of the Ukrainian issue, and the general decline in the level of military alert in Europe, a nuclear weapon-free zone in CEE can become one of the constituent elements, if not one of the pillars, of the new European security architecture in the medium term. The initiative to denuclearize the region has especially high chance of success if it is linked to the initiative to limit conventional arms in CEE based on some sort of the upgraded Treaty on Conventional Armed Forces in Europe (CFE 2.0). This will require huge efforts on the part of both Russian and Western (especially European) diplomats, military figures and experts, but it can serve as a starting point for reducing mutual alarmism towards each other and building at least neutral bilateral and multilateral relations in a businesslike, pragmatic manner".

Prospects for the Establishment of Nuclear Weapon-Free Zone in Central and Eastern Europe
Vladimir Orlov, Alexey Yurk
2022
Source:https://www.imemo.ru/publications/periodical/pmb/archive/2022/2-63/nuclear-non-proliferation-and-security/prospects-for-the-establishment-of-nuclear-weapon-free-zone-in-central-and-eastern-europe

The signal the Russian diplomats are sending to their European counterparts is that the condition under which the deployment of nuclear weapons in Belarus might be reconsidered is the withdrawal of the US' nuclear weapons from Europe and the elimination of appropriate infrastructure. Currently, that is not taking place and is hardly imaginable. Nevertheless, however dire it is in terms of the general benefits for the nuclear nonproliferation regime, the situation raises the issue of creating a zone free of nuclear weapons and desirably free of all weapons of mass destruction in Central Europe. The concept is not new. It has been proposed in the 1950s by Poland to establish a zone in Central Europe, covering West and East Germany as well. It was designed as a counterweight to US' plans for the deployment of nuclear assets. NATO, and primarily the United States, were not ready for such a dialogue. Currently, the conditions may be not ripe, but the parity in terms of tactical capabilities is established. Later on, we might put some thought into this

notion of establishing a nuclear-weapon-free zone in Europe and the denuclearization of the Eastern flank of NATO, which is currently Russia's utmost priority.

Cases № 2. Middle East and East Asia: from transfer of sensitive technologies to extended deterrence

As the reconfiguration of international relations proceeds, the United States is trying to invest more resources, more of its political and diplomatic might, to enhance its partners, to embolden them, to engage into confrontation activities with the American opponents in the respective regions. Examples of that are the anti-Iranian policies implemented by the United States in the Middle East and its anti-Chinese standing in East Asia. The basic strategy of Washington is to form alliances capable of supporting US operations against China, the DPRK, Iran, and to transfer sensitive technologies to that ends.

The most traditional example of conditional proliferation might be Israel, because the international community and the United States specifically were quite benevolent in the acquisition of nuclear weapons capability by Israel. Currently, if we speak about the Middle East, the next potential point of transfer of sensitive technology to US partners in the region might be Saudi Arabia. As reported by open media, there was some consideration being put into the option of transferring uranium enrichment technologies to Riyadh, which it seeks. The same might go with missile technology, and intelligence gathering the basic point is the following one: "The more ready you are to confront our opponents, the more willing we would be to transfer whatever you need to defend yourselves or rather offend our adversaries".

> ***"As the first initiative under AUKUS, recognizing our common tradition as maritime democracies, we commit to a shared ambition to support Australia in acquiring nuclear-powered submarines for the Royal Australian Navy. Today, we embark on a trilateral effort of 18 months to seek an optimal pathway to deliver this capability. We will leverage expertise from the United States and the United Kingdom, building on the two countries' submarine programs to bring an Australian capability into service at the earliest achievable date. The development of Australia's nuclear-powered submarines would be a joint endeavor between the three nations, with a focus on interoperability, commonality, and mutual benefit. Australia is committed to adhering to the highest standards for safeguards, transparency, verification, and accountancy measures to ensure the non-proliferation, safety, and security of nuclear material and technology. Australia remains committed to fulfilling all of its obligations as a non-nuclear weapons state, including with the International Atomic Energy Agency. Our three nations are deeply committed to upholding our leadership on global non-proliferation".***
>
> **Joint Leaders Statement on AUKUS**
> **September 15, 2021**
> *Source: https://www.whitehouse.gov/briefing-room/statements-releases/2021/09/15/joint-leaders-statement-on-aukus/*

In East Asia, in this regard we talk about three countries, namely Australia, Japan, and the Republic of Korea.

Speaking about Australia, one should pay attention to the AUKUS, a partnership between Australia, the UK and the US that has been designed to transfer submarines with nuclear propulsion to Canberra. The specific transfer may not run counter to the letter of the NPT.

As Washington and London currently declare, Australia will not have direct access to highly enriched uranium, which will be used in the nuclear propulsion system of the submarine. But at the same time, AUKUS creates a dangerous precedent, although it is being positioned as an exclusion, as something that would by no means become a typical experience. The idea that nuclear material can be diverted to a non-prescribed military use by a non-nuclear-weapon state is dangerous, especially when we talk about highly enriched uranium, the technologies of spent fuel processing, uranium enrichment, potential nuclear weapons usable materials. Although Australia is currently portrayed as an exemplary state in terms of nonproliferation practices and adherence to the IAEA Safeguards Agreement and its Additional Protocol, the situation might change in the future.

"The country is now [after shaping AUKUS] very much at odds with its geography and it has lost its way. We had the greatest gift any nation has ever been given, an island, a continent of our own and a border with nobody. All we had to do to keep it is be in it, be in the region, be in the region and be happy to be in the region. What a gift. But, no, we are not happy to be in the region. We are still trying to find our security from Asia rather than in Asia… The ignominy of it – the appalling ignominy of it speaks volumes about our incapacity to absorb the region, enjoy the region, be part of the region and to celebrate the fact we have been here. The thing is ... the area that matters most to Australia, the area which should be our strategic habitat, is the Indonesian archipelago: 250 million people in an arc across the northern reaches of Australia, a central part of ASEAN. This is where we matter most but instead of that we have got this sort of fiction, this thing called the Indo-Pacific – like a big rectangular box, on one end of the box is India, on the other end of the box is Japan, but in other words we're not focusing on the middle of the box which is Indonesia and Asean. We're on either end. It is like a see-saw at the park. We are on the wobbly ends but not the pivot at the middle. There is no way India is going to find itself with any naval military flotilla in the South China Sea to protect us from China… No, no, we are rushing over, this has got the Liberal party fingerprint all over it, now we're going to rush back to the Americans, we're going to rush back to a dated design. But the whole point of these hunter-killer submarines is to round up the Chinese nuclear submarines and keep them in the shallow waters of the Chinese continental shelf before they get to the Mariana Trench and become invisible. In other words, to stop the Chinese having a second strike nuclear capability against the United States. This is the game we're now in. In the Collins game, we were in the defence of Australia. In the Virginia class game, we are hunter-killing Chinese submarines. This changes our whole relationship… Taiwan is not a vital Australian interest. We have no alliance with Taipei. There is no piece of paper sitting in Canberra which has an alliance with Taipei. We do not recognise it as a sovereign state – we've always seen it as a part of China".

Paul Keating, former Australian prime-minister (1991-1996)
November 10, 2021
Source: https://www.theguardian.com/australia-news/2021/nov/10/it-would-make-a-cat-laugh-key-moments-from-paul-keatings-national-press-club-appearance

The more weight, the more political argumentation one puts into the exceptions to nuclear nonproliferation, the more harm one does to the NPT. The same practice regrettably might take place in the relations between the United States, Japan and the Republic of Korea.

Speaking about Seoul, we should recall the statements made by the current president of the Republic of Korea on the possibility of nuclearization of the country. Those statements were vetoed by the 2023 Washington Declaration concluded between President Biden and President of the Republic of Korea Yoon Suk Yeol. But the means, the specific solution to this problem is questionable.

> ***"The Alliance commits to engage in deeper, cooperative decision-making on nuclear deterrence, including through enhanced dialogue and information sharing regarding growing nuclear threats to the ROK and the region. The two Presidents announced the establishment of a new Nuclear Consultative Group (NCG) to strengthen extended deterrence, discuss nuclear and strategic planning, and manage the threat to the nonproliferation regime posed by the Democratic People's Republic of Korea (DPRK)".***
>
> **Washington Declaration**
>
> **April 26, 2023**
>
> *Source: https://www.whitehouse.gov/briefing-room/statements-releases/2023/04/26/washington-declaration-2/*

The alliance between the United States of America and the Republic of Korea has been officially upgraded to nuclear weapon status. For many years South Korea has been part of the US extended deterrence, but currently new consultations, new policymaking mechanisms are being put in place. US nuclear submarines will make and already make visits to South Korean ports. That leads to more instability in the region. That creates more division lines and that will likely force the arms race in Asia-Pacific region, and that is essentially harmful to nuclear proliferation.

NEW NUCLEAR NINE? COUNTRIES WHICH CAN GO NUCLEAR

What are the prospects for further proliferation of nuclear weapons in the world? This question of whether new nuclear-weapon states might emerge may be seen as a frivolous interpretation and alarmism, regarding the international situation. Yet, the international security architecture is under great strain, and it would be a mistake to be under the illusion that the NPT is something permanent. It was designed during specific times and it has its own reserve of reliability, which is being tested.

The first thing that it is needed to do is to elaborate a methodology of evaluating proliferation threats coming from specific factors. Many theoretical approaches exist in this area. In the traditional Western discourse, nuclear proliferation is related to considerations of security, prestige, and international standing. One might recall thoughtful works by Scott Sagan who has designed a model of the three drivers of proliferation[57]. Frankly speaking, the situation has changed since the end of the Cold War. Currently, nuclear weapons are not seen, especially given the efforts undertaken by the *anti-nuclear radicals*, as something which would radically improve the international standing, which would elevate the national prestige of a specific country. Thus, it would be better to focus more on specific security concerns felt experienced by this or that state. We should not be under the illusion that the technical capability to design and to produce a nuclear explosive device is equivalent to actual nuclearization.

[57] Find more: Scott D. Sagan. Why Do States Build Nuclear Weapons? Three Models in Search of a Bomb // International Security, Winter, 1996-1997, Vol. 21, No. 3 (Winter, 1996-1997). Pp. 54-86.

International political and diplomatic activity:
- Resistance to more intrusive international controls, blocking enforcement of guarantees of the IAEA.
- Preparations to withdraw from the NPT and other nonproliferation treaties accompanied by pertinent discussions among political scientists or political forces.

Unusual industry developments:
- Building of uranium enrichment and spent nuclear fuel reprocessing capacity way beyond the justifiable needs of the national nuclear power program.
- Manufacturing and deployment of delivery vehicles capable of carrying more than 500 kg of payloads over distances exceeding 300 km.
- Expansion or modernization of factories for producing high-precision systems on a massive scale.
- Procurement or fabrication of equipment for making explosive lenses of specified geometries.

Research and development (R&D) and security organizational efforts:
- Increased efforts by security services and private businesses affiliated with them to acquire dual-use technology in circumvention of export controls, and expansion of military, scientific and technical cooperation with high-risk countries.
- Expanding programs to train more specialists for relevant sectors and a spike in academic exchanges in sensitive fields of research.
- Abrupt decrease in publication activity of nuclear R&D centers, relocation of distinguished nuclear scientists to new unknown places of work.
- Steps to classify information regarding the leadership of nuclear R&D organizations and strengthen their personal security, to tighten counterintelligence controls at related facilities/organizations, and establish new sites with excessively high security levels that are at odds with their stated purpose.
- Creation of special administrative bodies vested with broad powers reporting directly to the supreme military and political leadership of the country, and appearance of organizational links between military and research entities [58].

Political propaganda at home:
- Sharp rise in hysteria and fearmongering in the public media. For Islamic countries, it would be the heightened activity of theologists issuing *fatwas* that hail the development of the WMD as something acceptable and even desirable.

Based on: PIR Center Report New Nuclear Nine? Assessing Nuclear Proliferation Threats in the World (in Russian) 2023
Source: https://pircenter.org/editions/new-nuclear-nine-report/

If we delve deeper into the theory, we will see that numerous factors exist in terms of domestic policy and specific types of national leadership. For instance, Western researchers posit that democracies, for some reason, are less likely to seek nuclear weapons. There are also autocrats who have a perception of being in a *besieged fortress* and are more likely to turn to nuclear options. If we devise some factors which would drive nuclear proliferation, the following should be pointed out. First and foremost, the perception of the security environment around a specific country, the existence of alliances, their reliability, the perception of the opponents and of its own force. They are many other specific indicators. Some of them are technical, some of them are political, but the discussion on nuclear weapons options, which is taking

place in Saudi Arabia and the Republic of Korea, might be seen as one of the red flags. If we talk about Muslim countries, then discussion within the theological community might also be a factor.

The following methodology can be used. First of all, we assess technical capabilities. We arrange the means of delivery and the nuclear fuel cycle by a quantified indicator from one to five, where one is the lowest grade, the absence of potential, and five is the utmost level of technical perfection in sensitive technologies. Regarding motivations, security concerns, the degree of insecurity described in countries' national program documents should be taken into account. Regarding factors opposing proliferation – the factors which might be an obstacle – we focus on the level of integration of a specific country into alliances, into military and political blocs and on the level of its integration into the global economy, the level of its vulnerability to potential sanctions and measures of economic and political pressure which might be triggered by the proliferation of nuclear weapons.

PIR Center Report New Nuclear Nine? Assessing Nuclear Proliferation Threats in the World. 2023

In 2023, PIR Center published its new Report *New Nuclear Nine? Assessing Nuclear Proliferation Threats in the World.*

> ***Together with ten of our colleagues, we devoted the last year to a comprehensive study of the risks of nuclear proliferation in the world for the next five to twenty years, overcoming some academic narrow-mindedness in this area. As a result, the contour began to be outlined. And the nine started to show up. We are well aware of the traditional, now existing nine states possessing nuclear weapons. Therefore, we were interested in another nuclear nine – a new one: states that could potentially start implementing military nuclear programs in the period from 2027 to 2042".***
>
> ***The Post-American World and Nuclear Non-Proliferation: 20 years with no room for error***[59]
> **Vladimir Orlov, Sergey Semenov**
> **2023**
> *Source: https://pircenter.org/en/editions/the-post-american-world-and-nuclear-non-proliferation-20-years-with-no-room-for-error/*

The results of analysis were as follows. The countries which are most likely to seek nuclear weapons are Iran, Japan, and the Republic of Korea. Other analyzed countries, in particular, Ukraine, Türkiye, Egypt, and Brazil, might do so, but currently there are no any drivers for that.

A specific case is Ukraine. The idea that Ukraine had the capability and had the desire to acquire nuclear weapons, which was voiced by President Vladimir Zelensky in his remarks during the Munich Conference[60], was taken quite seriously in Russia. That was one of the official reasons for the start of the Special Military Operation in 2022. The authors of the PIR Center Report proceed from the premise that all capabilities which were in place

[59] The article was initially published in Russian as: Орлов В.А., Семёнов С.Д. Постамериканский мир и ядерное нераспространение // Россия в глобальной политике, 2023. Т. 21. № 1. С. 72-87.
[60] Зеленский пригрозил пересмотреть отказ Украины от ядерного оружия // РБК, 19 февраля 2022 г.

before the start of the operation will be eliminated as the result. One specific conclusion, which is relevant to the countries that currently do not have the capability, is that nuclear rhetoric might be used as an instrument of blackmail, as an instrument to press partners and allies into more concessions, into providing more benefits.

Focusing on the possible proliferators, Iran is a specific case as well. Indeed, it has at least some part of the technical capability to produce a nuclear explosive device. Its stockpile of highly enriched uranium, which emerged because of the US withdrawal from the

	Potential		**Motivation**			Outcome
	NFC	Delivery Vehicles (DV)	Perceived threat (T)	Restraining factors		
				Allies (A)	Economic risks (ER)	
South Korea	3	4	5	4	0,75	3,32
Japan	5	2	5	4	0,5	3,46
Taiwan	3	4	5	5	0,75	3,19
Ukraine	2	2	5	2	1	2,68
Turkey	1	2	4	4	0,75	1,82
Iran	5	4	5	1	0,25	4,48
Egypt	1	2	4	2	0,5	2,21
Saudi Arabia	1	3	4	2	1	2,18
Brazil	4	1	1	3	0,5	1,09

The potential for the creation of nuclear weapons by the countries considered in the medium term. © PIR Center

Source:https://pircenter.org/en/editions/the-post-american-world-and-nuclear-non-proliferation-20-years-with-no-room-for-error/

JCPOA, might be called impressive. At the same time, notwithstanding the political pressure it faces, notwithstanding the attempts by the *collective West* and the United States specifically to form an anti-Iranian architecture in the Middle East, there is no political will in Iran to move towards nuclearization.

The cases of Japan and the Republic of Korea are quite different, because the technical capability, to different extents, do exist, and in terms of the Japanese standing, their technical potential exceeds the one possessed by Iran. At the same time, the motivation not to acquire nuclear weapons is inherent in the gist of their alliances with the United States. If Donald Trump becomes a president of the US again in 2024, Washington may seek to distance itself from the allies in the Asia-Pacific region, and Japan and South Korea could feel more inclined to develop technical deterrence and to make intermediate steps, such as acquiring means of delivery, etc. That is concretely seen in the example of South Korea. It has technically eliminated all of those legal restrictions imposed on it by the United States in the 1970s regarding the development of missile technology, and of nuclear enrichment, and in the upcoming years might be tempted to establish the same level of technical deterrence as Japan.

UNIT III.

DISARMAMENT AS THE SECOND PILLAR OF THE NPT. ARMS CONTROL AND STRATEGIC STABILITY

PAPER 12.

RISE AND FALL OF NUCLEAR ARMS CONTROL

Dmitry Stefanovich

ARMS CONTROL AND STRATEGIC STABILITY: TERMINOLOGY AT A GLANCE

Arms control is a tool for national security, and it is a part of a toolkit which is as important as development of national weapons, of strategies, of doctrines. This is the attitude that countries need to embrace in order to move forward with arms control. At the same time, arms control can contribute to global security. It can promote disarmament and it is a part of the efforts to achieve strategic stability.

"Strategic stability became a sort of *derivative* of the nuclear deterrence concept. Experts came to the conclusion that deterrence could be considered effective (stable) if both sides in a nuclear confrontation (the USSR and the United States) had approximately the same ability to strike back. It is this awareness by the military-political leadership of the two countries, supported by the corresponding structure of the nuclear forces, that minimizes the risk of a deliberate attack in the hope of avoiding a retaliatory strike or dramatically impairing it... Now it seems appropriate to ask whether the basic principles of the concept of strategic stability in relations between Russia and the United States can be applied to other countries. To answer this question, it is advisable to refer to some international documents directly related to the issue of strategic stability. On June 1, 1990, the presidents of the USSR and the United States signed the Soviet-United States Joint Statement on Future Negotiations on Nuclear and Space Arms and Further Enhancing Strategic Stability. The document said: "The objectives of these negotiations will be to reduce further the risk of outbreak of war, particularly nuclear war, and to ensure strategic stability, transparency and predictability through further stabilizing reductions in the strategic arsenals of both countries. This will be achieved by seeking agreements that improve survivability, remove incentives for a nuclear first strike and implement an appropriate relationship between strategic offenses and defenses" (Joint Statement, 1990). This document states the most detailed understanding of strategic stability agreed by Russia and the United States, which includes improving the survivability of the parties' strategic forces, eliminating incentives for a nuclear first strike, and emphasizing the need to take into account the relationship between strategic offensive and defensive weapons. There are many ambiguities in the proposed wording, of course; for example, it is not clear how exactly the relationship between strategic offensive and defensive weapons should be implemented in future agreements, and what is meant by *incentives for a nuclear first strike*. Nevertheless, the document reflects a common understanding of the essence and content of strategic stability".

Nuclear Deterrence, Strategic Stability, Missile Defense
Alexander Savelyev
2023
Source: https://eng.globalaffairs.ru/articles/nuclear-deterrence/

But what is strategic stability? There are different attitudes to these two words as well. The basic definition of strategic stability was determined in the Joint Statement on Future Negotiations on Nuclear and Space Arms and Further Enhancing Strategic Stability, concluded by the US and the Soviet Union in 1990. The idea of strategic stability is that neither side has incentives to carry out a first nuclear strike. However, there is no definition of what a first nuclear strike is. Anyway, analysts usually go in that direction. But there is also a broader definition of strategic stability which, including in some latest US and Russian documents, is understood as a such a state of relations between great nuclear powers that prevent any and all military conflict between them.

Strategic stability can be achieved through greater transparency and understanding of each other's forces, through development and deployment of delivery vehicles that do not undermine strategic stability, and through some level of ambiguity.

Arms control can take different forms. There are also broader definitions and narrower definitions, and the idea is that arms control is also hardly and deeply intervenient with the notion of risk reduction. There are different schools of thought. Some people argue that risk reduction measures are just a part of the whole toolkit of arms control mechanisms. Others argue that arms control itself is a part of a broader menu of risk reduction measures. So, arms control can be understood as any means that help to achieve limits, transparency, the very general situation where the countries that are engaged in competition or even confrontation do not move towards greater escalation and do not have incentives to strike first.

- Arms control – a set of measures aimed at cessation of arms build-up, their limitation, reduction and elimination as well as measures aimed at arms nonproliferation.
- Arms control – the process of cooperation between states on the issues of restriction, reduction, nonproliferation, production of weapons, deployment and/or use of military forces.
- Disarmament – efforts aimed at the increasing stability of international relations with decreasing the number of military forces and weapons by effective and verifiable agreements and confidence-building measures.

General Evgeny Buzhinsky

Some types of arms control focus on soft measures, some types of arms control can be even unilateral. But top, or *peak* arms control is the arms control based on legally binding treaties signed and ratified on the highest level, those can be bilateral, multilateral and those need a very deep, intrusive verification mechanisms to be sure about what you are seeing and what you are being told. However, currently such *peak* arms control is in deep crisis.

It is important to understand that arms control is not only about nuclear weapons. Arms control is also about conventional weapons, and the greater level of entanglement between nuclear and conventional capabilities is one of the challenges.

While not having its best moment these days, arms control remains a viable option. No one should think that everything that has been done before should be put in the garbage

bin – it would be right to study the experiences, to learn from the mistakes and to use the basis that is already there. Of course, there are new challenges, new actors, and new domains. But this does not mean that old tried and true mechanisms cannot be adapted to these new domains.

COLD WAR STORIES: LTBT, OST, NPT, SALT FAMILY, ABM TREATY, INF TREATY

1963	–	Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water, or Partial Test Ban Treaty (PTBT), or Limited Test Ban Treaty (LTBT)
1967	–	Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, or Outer Space Treaty (OST)
1968	–	Treaty on the Non-Proliferation of Nuclear Weapons, or Non-Proliferation Treaty (NPT)
1972	–	Strategic Arms Limitations Talks Treaty I (SALT I)
1972	–	Anti-Ballistic Missile Treaty (ABM Treaty, ABMT)
1979	–	Strategic Arms Limitations Talks Treaty II (SALT II)
1987	–	Intermediate-Range Nuclear Forces Treaty (INF Treaty)

▶ *1963 Limited Test Ban Treaty (LTBT)*

Nuclear tests can be used as a means for pursuing national security. Nuclear tests are good for signaling. In the 1950s, there was still an ongoing epic development of the technology behind nuclear weapons, so it was more or less understood that the countries needed those. Also, there was a need to obtain actual data, actual knowledge about the effects of nuclear explosions, of nuclear detonations, and to find ways to protect populations, and industry, and military. Without active nuclear testing (including atmospheric nuclear tests), the US and the USSR could have taken a different path that could have ended up in actual nuclear warfighting.

However, given that there was a huge volume of information obtained by the relevant militaries, there was a growing understanding that fighting a nuclear war is quite a hard thing. It complicates not only your adversary's life, but also your own, especially if your adversary also has a vote in the conflict. So, in 1963, the Limited Test Ban Treaty was achieved. This treaty banned nuclear explosions everywhere except the underground tests. They still were used to develop new weapons and contributed to reliability of nuclear arsenals. Anyhow, the LTBT was seen as some sort of a limit to the further development of nuclear weapons and also as a means of nonproliferation.

▶ *1967 Outer Space Treaty (OST)*

This Treaty effectively banned nuclear weapons to be deployed in orbit. But it does not address the issue of outer space militarization and weaponization. It is understandable because the space domain has been militarized since its inception.

▶ *1968 Nuclear Nonproliferation Treaty (NPT)*

NPT was a major milestone of the previous Cold War. It effectively curbed the spread of nuclear weapons. Of course, as many other international documents, it is imperfect, and some people can even claim that it is a *colonial* treaty because only five states were allowed to keep nuclear weapons in their arsenals. However, it was done in exchange to the commitments for nuclear disarmament, which has to be linked with the general and complete disarmament (but many people and states prefer to forget about it). Also, a commitment to help non-nuclear-weapon countries with the peaceful uses of nuclear energy was made. Anyhow, the NPT already used to survive much turmoil.

▶ *SALT family treaties*

In 1972 and in 1979, the Soviet Union and the United States concluded two treaties on strategic arms limitation which sometimes referred as *SALT family*. Interestingly enough, at this era the two countries were talking about thousands of delivery vehicles and tens of thousands of nuclear weapons which were not actually appropriately limited. Still, the efforts were made to curb the arms race both in terms of quantities and qualities. *SALT family* treaties were not very deeply verified, the countries relied on the national technical means to ensure compliance. 1979 SALT II was never ratified by the US and did not enter into force. During the SALT era there were a number of military conflicts around the world with explicit involvement of the Soviet and American military servicemen (Vietnam, Afghanistan). But it did not derail the whole process. The countries understood that there was the higher level of nuclear stability they needed to achieve.

> ***“... it was the earlier 1980s, there were a lot of discussions about issue of linkage. To be more precise, some specialists were arguing whether you could not isolate arms control talks from everything else, believing it should be only arms control itself without any linkage to other international problems. At that time pro-arms control people say something of that kind: “Arms control is very important, we should have it even if there are so many disagreements between the US and the Soviet Union”. In 1980s, the Soviet military campaign in Afghanistan was going on, but the US, indeed, still wanted to hold talks with the USSR on arms control. But sometimes the influence of your relationship with each other is so big that you cannot isolate arms control from other problems, and such a linkage becomes inherent”.***
>
> **Jeffrey Knopf, Chair of the MA Program *Nonproliferation and Terrorism Studies* of the Middlebury Institute of International Studies at Monterey, USA, in an interview for PIR Center**
> **May 17, 2023**
> *Source: https://pircenter.org/en/editions/historically-when-dealing-with-nonproliferation-people-are-thinking-primarily-about-states-but-in-the-case-of-wmd-there-is-also-a-need-to-study-non-state-actors-an-interview-with-professor-jeffrey-kn/*

The SALT negotiations process also led to the understanding on how to calculate nuclear weapons, on which sorts of weapons were actually strategic, and so on. There were numerous cases on how to calculate, for example, heavy bombers armed with long-range cruise missiles. And what is a heavy bomber? What is an intercontinental ballistic missile (ICBM)? What is a submarine-launched ballistic missile (SLBM)? When the submarines armed with such missiles become strategic, obtain strategic capabilities? All the findings

related to such questions were achieved during the SALT talks. Besides, the SALT II can be an example of a treaty that can be agreed upon, never ratified but still work despite that.

▶ 1972 *Anti-Ballistic Missile Treaty (ABM Treaty)*

In 1972, the ABM Treaty was signed. It was also a pillar of strategic stability. For the first time the Americans and then the Soviets embraced the idea that development of ballistic missile defense was a destabilizing factor: one day you might come to a conclusion that you are protected enough and resort to nuclear coercion or even use of nuclear weapons. The interesting fact is that at those days the USSR was few steps ahead of the US in terms of development of ballistic missile defenses, and it was an American initiative to conduct the talks on ABM systems.

Why was the Treaty signed? The understanding was achieved that despite the fact that the attacking side had advantage, still if someone started to develop ballistic missile defenses and deploy them in huge numbers, it would affect the threat perception. You cannot be sure how effective those are, and you engage in an arms race just to be sure you need an extra warhead, an extra missile. That was why when the ABM Treaty was signed and limited the volume of the development and deployment of missile defense systems, it was a good thing.

First crisis the ABM Treaty faced was the Strategic Defense Initiative (SDI) proposed by Ronald Reagan administration (1981-1989). And the Treaty came over it. The second one was the decision of the George W. Bush administration (2001-2009) to withdraw from the Treaty. In 2002, the US finally did it despite serious efforts by both the US and Russia in the late 1990s to achieve some level of understood limits on missile defenses and on their development without destroying the Treaty itself. Given the empirical evidence, it seems that 30-years period is a normal lifespan for an arms control treaty. What is important that both the SDI and withdrawal from the ABM Treaty led to qualitative arms race. On the Soviet/Russian side a huge number of counter measures – symmetrical and asymmetrical – were developed and some of those are reaching fruition right now.

▶ 1987 *Intermediate-Range Nuclear Forces Treaty (INF Treaty)*

The INF Treaty was the most important agreement between the USSR and the US for the arms control regime in the Cold War era. The Treaty obliged for a total destruction of a whole class of nuclear delivery systems. However, it is important to remember that the name of the Treaty despite the popular acronym – *intermediate-range nuclear forces* – had nothing to do with nukes themselves. Its original name speaks only about missiles, they are the delivery vehicles. This was to some extent an issue that led to the demise of the Treaty eventually. Additionally, hugely important result of concluding the INF Treaty was the fact that it was the first treaty with a deeply understood and deeply developed mechanism of verification to *verify* the disarmament process.

INF Treaty ceased to exist. Given the explicit comments by some of the US officials, it died because of the need for Washington to pursue some sort of military development vis-a-vis China in the Western Pacific. But, as usual, alleged Russian violation was a pretext for the US to withdraw from the Treaty.

CONVENTIONAL ARMS CONTROL

In parallel with the nuclear arms control talks, another process of dealing with conventional forces was put in motion. For example, from 1973 to 1989 there were several talks between NATO member states and countries of the Warsaw Pact Organization devoted to mutual and balanced force reductions (MBFR). This was a negotiation process initiated to address the perceived conventional imbalances in the European theater the two organizations. Eventually, it resulted in signing in 1990 Conventional Forces in Europe Treaty (CFE Treaty). However, it coincided with the dissolution of the Warsaw Pact and of the Soviet Union. Efforts were put in motion to adapt the CFE, but those failed.

Another important document in the realm of conventional arms control is the Open Skies Treaty signed in 1992. It established the regime for the conduct of observation flights. Under the Treaty, its parties, including European countries, and Canada, Russia (which is also a European country), and the US, could overflow each other with a certified aircraft capable of taking pictures. Originally the film cameras were used. Then a shift to digital cameras started, and Russia was on the frontline of this development, but there was not much interest in the US in keeping up with the others, especially given the fact that the US actively applied satellite technology and capability to use space layer to achieve almost the same level of details that one can achieve with the aircraft. And so, despite the efforts by the Europeans and by the Russians to save the Treaty, the US decided to withdraw from it in 2020, and Russia followed suit. However, Belarus and NATO allies are still parties to the Treaty, and probably it can resurface in some other form eventually, despite the fact that it is somewhat outdated due to the rapid technological development.

DEVELOPING ARMS CONTROL REGIME IN 1990S AND 2000S. START FAMILY AND SORT

1991	–	Strategic Arms Reduction Treaty I (START I)
1993	–	Strategic Arms Reduction Treaty II (START II)
2002	–	Treaty Between the United States of America and the Russian Federation on Strategic Offensive Reductions (SORT), or Treaty of Moscow
2010	–	Treaty between The United States of America and the Russian Federation on Measures for the Further Reduction and Limitation of Strategic Offensive Arms (New START)

▶ *1991 Strategic Arms Reduction Treaty I (START I)*

The START I was signed by the US and USSR in 1991. It was the first to actually put limits on the nuclear warheads, not only delivery vehicles. The START I was not perceived as a final step in terms of disarmament. It was considered as a bridge towards the future where even if the two states cannot achieve total nuclear disarmament, the overall situation would be much less nuclear focused.

Such mutual understanding, mutual transparency, the volume of shared data was simply impossible in other eras under other documents. We still use the data shared and made public during the START-related negotiations when we talk about the current developments in nuclear forces. START I put limits to the development of new delivery systems, especially in the US, but to some extent also in Russia. Until the US withdrew from the ABM Treaty, things like lab-to-lab cooperation were launched, where actual nuclear weapon designers had a direct access to each other and could share some information.

What is also crucial with START I, during the talks negotiators put a lot of efforts to discuss throw-weights, to find a way to account for heavy bombers, which were artificial (like there were provisional numbers, for example, of warheads that should be allocated for this or that heavy bomber, not the actual one because of the obvious problem with verifying them). And with the START I the two states started to deploy inspection teams on a strategic bases to evaluate what was going on there with nuclear warheads.

▶ *1993 Strategic Arms Reduction Treaty I (START II)*

Regarding the START II, an effort was made to get rid of all multiple independently targetable reentry vehicles (MIRVs) on ICBMs as the idea to concentrate on a huge number of nuclear warheads and delivery vehicles was considered to be destabilizing. The Treaty was signed in 1993, and it took a while to ratify this Treaty. And in Russia, there were quite serious efforts made by the government, despite the opposition in some of the State Duma circles. Anyway, Russia did ratify the Treaty, but due to contradictions over the ABM Treaty, the START II never properly entered into force.

▶ *2002 Treaty Between the United States of America and the Russian Federation on Strategic Offensive Reductions (SORT), or Treaty of Moscow*

SORT between the US and Russia further limited nuclear weapons. But it did not include the hard limits on types of weapons, which were in START where we talked about sub-limits on heavy delivery vehicles, on light ICMBs, and so on.

▶ *2010 Treaty between the United States of America and the Russian Federation on Measures for the Further Reduction and Limitation of Strategic Offensive Arms (New START)*

The New START was signed by the presidents of the US and Russia Barack Obama (2009-2017) and Dmitry Medvedev (2008-2012) in 2010. Some Russian experts actually argue that it is the first balanced treaty that do not put Russia in a worse situation because previously the USSR/Russia had to dismantle much bigger number of nuclear weapons and there were symmetrical limits for the two sides which did not consider the differences in geography, the structure of nuclear arsenals and so on. With the New START the US and Russia finally achieved a freedom to mix heavy bombers, land-based ICBMs, SLBMs, etc.

Regarding heavy bombers in the New START, the most interesting thing was that the US and Russia introduced an artificial means of calculating. So, a heavy bomber is both a delivery vehicle and a single nuclear warhead for New START. Some people argue that it is not the best approach, others think that it is a good way to make it doable. And with the New START, the central limits were achieved at due time. However, some problems with the Treaty came up.

"... [Russian] Foreign Ministry provided a detailed assessment of the deplorable state of affairs regarding the implementation of the New START resulting from the destructive actions by the United States in the context of this agreement, as well as its overall policy line to weaken the security of the Russian Federation and «strangle» our country in political and economic terms... The Russian Federation found itself in a radically new security environment resulting from Washington's extreme hostility and efforts to stir up confrontation, as well as its openly set course for a malicious escalation of the conflict in and around Ukraine... the United States is now openly seeking to inflict a strategic defeat on Russia, while tensions encouraged by Washington go far beyond the Ukraine crisis with the United States and the US-led West trying to harm our country at every possible level, in every sphere and region of the world... There is every reason to conclude that the United States policy aims to undermine Russia's national security, which directly contradicts the fundamental principles and understandings set forth in the New START's preamble and forming its foundation... In this situation, it is no longer possible to maintain business as usual with the United States and the West in general, both as a matter of principle and regarding arms control, which is inseparable from the geopolitical, military and strategic reality... In this context, the integrated nuclear capability of the three nuclear powers within NATO, namely the United States, Great Britain, and France, takes on special importance in today's environment. This capability can be turned against Russia. In this sense, it is quite symbolic that all NATO countries, including Great Britain and France, have explicitly confirmed their involvement in matters related to the New START by issuing a joint statement to fully support the US approaches. This political gesture confirmed that Russia adopted a justified position in viewing the nuclear capabilities of the three Western nuclear powers as forming a single whole, taking this factor into consideration when dealing with processes related to nuclear arms limitation and reduction, as well as when exploring matters related to the New START's future. Washington has for years disregarded the interrelationship between strategic offensive and strategic defensive weapons, which is also sealed in the New START... Of vital importance for assessing compliance with New START is the fact that Washington has long been substantially violating the fundamental provisions of the Treaty on the quantitative restrictions of the parties' relevant armaments. This includes the unilateral withdrawal from the accountability under the Treaty of over 100 units of the US strategic offensive arms, which Washington has renamed in order to withdraw them from the Treaty provisions or it has declared as converted without giving Russia an opportunity to reliably verify the compliance of such conversion with the Treaty provisions, in accordance with the Treaty...

In addition, the United States undertook clearly provocative and extremely dangerous attempts to probe the protection of several Russian facilities included in the Treaty. The armed attacks on them, which the puppet regime in Kiev launched, were organised with Washington's obvious military-technical and intelligence assistance. In this context, we regard as utterly cynical Washington's demand that they be given immediate access to these and other Russian strategic facilities declared under the New START provisions on inspections. This is especially outrageous in conditions when Washington's anti-Russia restrictions have impaired the efficiency of the verification procedures stipulated in the Treaty. As the result, Russia's ability to freely conduct verification inspections on a fully equal basis in US territory has

been curtailed, creating obvious unilateral advantages for the United States… In this context, President of Russia Vladimir Putin announced in his February 21 Address to the Federal Assembly that Russia suspends the New START. In order to maintain the necessary level of predictability and stability in the nuclear missile area, Russia will take a responsible approach and will continue to strictly comply with the quantitative restrictions stipulated in the Treaty for strategic offensive arms within the life cycle of the Treaty. Russia will also continue to exchange notifications of ICBM and SLBM launches with the United States in accordance with the relevant Soviet-US agreement signed in 1988. The decision to suspend the New START can be reversed if Washington demonstrates the political will and takes honest efforts towards general de-escalation and the creation of conditions for resuming the comprehensive operation of the Treaty and, consequently, its viability…".

Foreign Ministry statement in connection with the Russian Federation suspending the Treaty on Measures for the Further Reduction and Limitation of Strategic Offensive Arms (New START)
February 21, 2023
Source: https://mid.ru/en/foreign_policy/news/1855184/

The major issue that was raised by the Russian side was that quite a number of delivery vehicles in the US were converted in such a way that did not make Russia confident that these or that weapons would not be reconverted into nuclear delivery vehicles. Besides, the upload capability was discussed through the whole START era. To limit the number of deployed nuclear warheads the sides agreed that they could keep a stockpile, and they would not verify the number of weapons in the stockpile. Whether it was a good idea or a bad idea, history will tell, but nuclear disarmament is not an easy thing, and to dismantle a warhead takes time.

During the COVID-19 pandemic, the on-site inspections and meetings of the bilateral consultative commission were stopped and after they never restarted. Nevertheless, in 2021 the Treaty was extended until 2026 when it will finally expire. In 2023, Russia suspended its participation in the New START due to hostility from the US and the *collective West* which are actively providing Ukraine with military assistance during the Russia's Special Military Operation. This is a huge example of how other domains affect the nuclear arms control.

Nobody is sure whether another START-type treaty is achievable between the US and Russia, but the countries should try to have something like that, because this is the basis upon the whole arms control can be developed. It is important to mention that arms control treaties, no matter what type of area they cover and no matter how intrusive those are, they provide a room for relations between the servicemen, between the military people, between the diplomats of the countries involved in negotiations and then in treaties implementation. And such a link, these people-to-people relations are a huge factor that helps countries, especially if they are adversaries, to avoid misperceptions and inadvertent escalation.

CHINESE CAPABILITIES AND ARMS CONTROL EXPERIENCE

China has been an important factor in arms control for quite a while. China is a nuclear-weapon-state officially recognized by the NPT. China has some offensive nuclear doc-

trines including the separation of warheads and delivery vehicles in peace time, no-first-use of nuclear weapons, and so on. And China is perceived (primarily by the US) as a country that *does not like* arms control. However, it is not entirely true.

When the relations between the Soviet Union and the People's Republic of China began to normalize in the late 1980s, there was a growing understanding that they needed to do something with a huge number of military deployments along the Soviet-Chinese border. And so, conventional arms control came into place: the agreements about limits and reductions on arms forces along the Soviet-China border (and then Russian-China border) and the border of China and some of the post-Soviet Central Asia republics came into being in 1990s. Besides, Russia and China signed an agreement on notifications on ballistic missile and space launch vehicles. This was quite limited compared to other launch notification agreements, but it is still there, and a notification mechanism still exists. And it can be considered as arms control.

China understands the value of arms control. However, Chinese understanding of strategic stability, or global strategic stability (that which is somewhat shared now with Rus-

All figures are approximate and some are based on assessments by the authors.

Type/Chinese designation (US designation)	No. of launchers	Year first deployed	Range (km)[a]	Warheads x yield[b]	No. of warheads[c]
Aircraft	*20*[d]				*20*
H-6K (B-6)	10	2009	3 100	1 x bomb	10
H-6N (B-6N)	10	2020	3 100	1 x ALBM	10
H-20 (B-20)	–	[2028]	..	..	–
Land-based missiles	*382*				*318*
DF-4 (CSS-3)	6[e]	1980	5 500	1 x 3.3 Mt	–
DF-5A (CSS-4 Mod 2)	6	1981	12 000	1 x 4–5 Mt	6
DF-5B (CSS-4 Mod 3)	12	2015	13 000	5 x 200–300 kt	60
DF-5C (CSS-4 Mod 4)	..	[2024]	13 000	[MIRV]	..
DF-15 (CSS-6)	..	1990	600	1 x ..[f]	..
DF-17 (CSS-22)	54[g]	2020	>1 800	1 x HGV[h]	..
DF-21A/E (CSS-5 Mod 2/6)	24[i]	2000/2016	>2 100[j]	1 x 200–300 kt	24[k]
DF-26 (CSS-18)	162	2016	>3 000	1 x 200–300 kt	54[l]
DF-27 (..)	–	[2026]	5 000–8 000	1 x 200–300 kt	–
DF-31 (CSS-10 Mod 1)	6	2006	7 200	1 x 200–300 kt	6
DF-31A/AG (CSS-10 Mod 2)[m]	84	2007/2018	11 200	1 x 200–300 kt	84
DF-41 (mobile version) (CSS-20)	28[n]	2020	12 000	3 x 200–300 kt	84
Sea-based missiles (SLBMs)	*6/72*[o]				*72*
JL-2 (CSS-N-14)	–	2016	>7 000	1 x 200–300 kt	–
JL-3 (CSS-N-20)	72[p]	2022	>10 000	[Multiple]	72
Total stockpile	**474**				**410**

Chinese nuclear forces (as of January 2023)

Source: https://www.sipri.org/sites/default/files/YB23%2007%20WNF.pdf

sia), is much broader than the narrowest strategic stability understanding discussed previously. It is not only about first nuclear strikes, but also about almost all factors that affect international security and can eventually lead to a nuclear escalation.

Whether China can become a proper actor in arms control remains to be seen, and the US and to some extent Russia are not showing the best example simply because it is hard to argue that arms control is good when both states are getting rid of arms control treaties. However, the Russian narrative is much more consistent here compared to changes in statements between the US administrations and general attitude in the US that arms control is always something that limits the US capabilities as a sole superpower. Russia continuously argues that arms control is important, China is also not against it. But now China is developing new capabilities and deploying more and more nuclear weapons and nuclear delivery systems. China is really becoming a military superpower, and nuclear domain seems to be an important part of this status.

Probably the absence of China in the development of nuclear arms control between Russia and the US has been a part of the past two current crisis regarding the INF Treaty and the New START, especially given the huge disarmament that was achieved by Russia and the US. Of course, China, as well as the UK and France, has much smaller arsenals, but they are not that smaller as it used to be during the peak Cold War. And the relative weight of each Chinese warhead, and French, and British ones is quite more significant than it used to be compared to the weight of the Russian and American nuclear arsenals.

DECLINE OF NUCLEAR ARMS CONTROL REGIME: A LONG PATH TO THE CURRENT CRISIS

Obviously, now a serious arms control crisis is being observed. People argue – in many capitals and elsewhere – that arms control is outdated, has no meaning, no mission. But this is too grim of a worldview. The factors that contributed to such attitude can be related to quite a number of developments both in the global arena and within the national borders. The problem is that now we have more and more contradictions between the major powers. The relative weight of nuclear arsenals of third powers is much greater. Also, the build-up of strategic capabilities (which can be nuclear, but not necessarily) affect the threat perception in different countries. For example, a lot of the US efforts in missile defense development are generally focused on a perceived threat from the DPRK. However, American efforts to strengthen ABM systems influence the threat perception of Russia and China which start to invest in new weapons to counterbalance the US missile defense and also to enhance their own missile defense. At the same time, China has rather troubling relations with India, which in its side has a deterrence-based relations with Pakistan. All of this jointly moves towards the current crisis in arms control domain.

On the European side, the crisis entered the hot phase. At the same time, NATO is a nuclear alliance. While status of the British and the French nuclear forces within NATO is different, still they have quite capable delivery systems, and the level of cooperation between the UK and the US in terms of strategic submarines, their SLBMs and their warheads is enormous. It seems natural to try to somehow calculate those capabilities and engage France and Great Britain in arms control.

What can be done for now? There is an NPT-related mechanism of coordination called the Nuclear Five, or P5. While it is hard to believe that some sort of a START type treaty or even a SALT type treaty can be achieved between the five nuclear-weapon states simply because the arsenals are vastly different both in composition and in numbers, measures to reduce nuclear risks, to ensure verification and transparency, and the very discussion of doctrines (which is already taking place) are important factors which contribute to international peace and security and can also help to limit the scope of qualitative and quantitative arms race if not prevent in.

"The People's Republic of China, the French Republic, the Russian Federation, the United Kingdom of Great Britain and Northern Ireland, and the United States of America consider the avoidance of war between Nuclear-Weapon States and the reduction of strategic risks as our foremost responsibilities. We affirm that a nuclear war cannot be won and must never be fought[61]. As nuclear use would have far-reaching consequences, we also affirm that nuclear weapons – for as long as they continue to exist – should serve defensive purposes, deter aggression, and prevent war. We believe strongly that the further spread of such weapons must be prevented. We reaffirm the importance of addressing nuclear threats and emphasize the importance of preserving and complying with our bilateral and multilateral non-proliferation, disarmament, and arms control agreements and commitments. We remain committed to our Nuclear Non-Proliferation Treaty (NPT) obligations, including our Article VI obligation "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". We each intend to maintain and further strengthen our national measures to prevent unauthorized or unintended use of nuclear weapons. We reiterate the validity of our previous statements on de-targeting, reaffirming that none of our nuclear weapons are targeted at each other or at any other State".

Joint Statement of the Leaders of the Five Nuclear-Weapon States on Preventing Nuclear War and Avoiding Arms Races
January 3, 2022
Source: http://en.kremlin.ru/events/president/news/67551

Nevertheless, a hugely important factor for the future of arms control is that the relations between Moscow and Washington, Washington and Beijing, Moscow and Beijing, Moscow and Brussels towards that matter are very different from what it used to be. Whether it will be possible to overcome these differences, whether the states will be able to achieve greater common understanding, especially of the threat perception of each other, whether they will be ready to address mutual concerns, remains to be seen. However, the fact that nuclear weapons still exist and are even kept in a good shape, deployed, and can be delivered, means that there is no alternative to arms control, because otherwise the continuous escalation will take place. This escalation has a quite limited number of outcomes. The ultimate outcome is an all-out nuclear war. Arms control is a hugely capable instrument of achieving greater national security, because if a country relies on the self-help solely, it will always feel threatened, vulnerable, because it will have very

[61] For the very first time this tenet was proclaimed by President Ronald Reagan and General Secretary of the Communist Party of the Soviet Union Mikhail Gorbachev at their summit in Geneva in 1985. It was reiterated in January 2022 by the leaders of China, France, Russia, the UK and the US. – Editor's Note.

limited understanding of the capabilities and the intentions of its adversary, especially in a multilayered competition that is being observed now.

TECHNOLOGIES AND POLITICS: IMPLICATIONS OF NEW FACTORS FOR ARMS CONTROL REGIME

There are quite a number of factors that affect strategic stability and also can be addressed through arms control and related measures. One of those is the arrival of new important players to this playground. More importantly, these new actors have different capabilities and different priorities.

▶ *Growing number of conventional non-nuclear weapons with strategic effect*

Here comes probably the most important factor that has its role both in crisis of arms control and in making the situation much less understandable, namely a several non-nuclear capabilities with strategic effects. This is the growing number of superior conventional weapons, specifically and most importantly long-range precision weapons. Those are mainly conventionally armed cruise missiles, long-range ballistic missiles, long-range drones and hypersonic missiles. Why are those important? Their effects are twofold. First, the growing number of such capabilities helped to develop the concept of non-nuclear deterrence which is currently somehow undermined by the actual performance of long-range precision weapons in some countries, but it is there. So, the idea is that you can achieve strategically significant objectives by using only conventional weapons. *Strategic mission* itself is a concept quite hard to digest. Some people argue that it is something that dramatically changes the course of armed conflict, others say that is basically taking out things that are considered strategic (strategic infrastructure, strategic weapons and so on).

But it is impossible to believe that even military superpowers can take out all the nuclear capabilities with non-nuclear means. How should strategic conventional weapons be addressed? It remains to be seen. One of the ways to look at it is basically to label some of those as strategic and put them under joint ceilings as strategic nuclear weapons. Other thing is just to focus on *behavioral* arms control, basically do not bring your platforms to these or that locations, do not generate forces in numbers that will be perceived as a very real threat. However, all those efforts have a huge issue, they can be fruitful only if there is readiness to address the concerns by everyone involved. Unfortunately, it does not seem that it is the case right now.

▶ *INF-range missiles development*

A subsection of this issue is the demise of the INF Treaty. The Treaty was important, not only because it introduced new verification measures of arms control, but also because it addressed the *fast flyers*. The ballistic missiles that were deployed in Europe left a very little time for Moscow and European capitals to react. They basically made it possible to destroy targets in the European part of Russia and the Eastern, Central and Western Europe in a blink of an eye, which is not very stable. Now, we see that at least in the US very serious efforts to develop conventionally armed INF-range weapons are being put in place, and those can eventually appear not only in Asia but also in Europe. How this will now be perceived in Russia remains to be seen. So far there is standing moratorium

initiative, and Russia will not be the first to deploy INF-range weapons in regions where American-made weapons are not deployed. But what is important is that INF-range weapons are not only developed in the US and developed in Russia per official claims but also in many other countries. For example, China has a huge arsenal of INF-range weapons, not all of them are nuclear, of course, and those weapons are quite capable. But it might become an issue for Russia as well as there is a major concern for the US Navy and for the US allies in the Western Pacific. Besides, the DPRK and the Republic of Korea developed quite a sophisticated arsenal of very capable missiles. And both of them are not only developing land-based missiles but also submarine launched missiles. Iran, India and Pakistan are also major players in missile development. So, the layers of the issue related to intermediate range missiles are quite numerous.

▶ *Information and communication technologies (ICTs), cyber domain and electronic warfare*

Other factors that should be covered are the those which related to the proliferation and development of information communication technologies (ICTs), to cyber weapons, to the artificial intelligence (AI) and to electronic warfare. Sometimes experts consider electronic warfare and cyber warfare as a very interlinked area. How does it boil into nuclear arms control? The digitalization of communications is leading to many vulnerabilities. Of course, efforts are made to separate all strategic weapons from general purpose networks and so on, but there are still vulnerabilities. One of the great examples is the *Stuxnet case* when the Iranian nuclear enrichment facility was undermined through cyber means. Now there are many well-known facts about cyber vulnerabilities of satellites.

Another important factor in this context is the artificial intelligence. It is a very broad concept, and when this or that military talks about the AI elements, they are usually speaking about things like machine learning or some algorithmic capabilities. Nevertheless, AI influences arms control as well. For example, it helps to ensure onboard controls of this of that guidance system, of this or that weapon. Besides, there is a quite proliferated number of decision-making support systems. Why is it important? Because the tempo of operations these days is quite high. Even if we speak about nuclear operations (which we will never see hopefully), the people who will make decisions will get some alternative options including based on decision-making support systems which use artificial intelligence elements. Of course, any system that relies on digital data has vulnerabilities, and it can be undermined through spoofing, jamming, *feeding* wrong data. It remains to be seen how the situation will develop, whether there will be some international efforts to limit the scope of autonomy in weapons including strategic weapons, or whether the states will be okay with greater transparency in this domain.

▶ *Outer space as a strategic domain*

Regarding the outer space, there is a growing reliance both in terms of nuclear and conventional warfighting. There are different attitudes to the role of space domain, with the US probably being more reliant, Russia less reliant, China somewhere in between, but this is just an assumption. Outer space is important for strategic capabilities because it provides sensors, early warning systems, strategic communications. Hopefully, nuclear weapons will never be deployed in the outer space. But the risks of such developments are not something that one should totally ignore.

We also see that space-based infrastructure is vulnerable to cyberattacks. At the same time some space infrastructure is dual capable, or dual use. Some satellites are used for communications but also as early warning systems that detect the launches of adversary strategic weapons. Some early warning satellites can work not only as a strategic layer as well as those can be used for theater operations to look at the launches of tactical missiles or even takes-off of aircraft.

On the ground-based segment, there is a wide interconnection of space situational awareness, or space domain awareness capabilities, that also work together with early warning capability and can be also a part of the ABM architecture. So, a state does not only see what happens in space but also provide some raw targeting data. This is a huge issue which is quite hard to address through arms control, but just agreeing that some parts of the space infrastructure, both space-based and ground-based, are off limits definitely might be a good step forward.

Moreover, there are a growing number of actors in the space race. While great powers can agree on some limits, there will always be some middle and small powers or even commercial non-state actors with their own agenda and preferences.

▶ *Issue of multilateralization of arms control regime*

Those days it is hard to imagine that Moscow and Washington will be able to agree on some sort of a major arms control deal that would not take into account other parties. Of course, there is a kind of official narrative in the US that China must be a part of future arms control efforts, which does not mean that it should be something trilateral, but still China should be involved in negotiations on arms control. Russia does believe that France and the UK should be a part of them as well. And it is a long-standing attitude.

▶ *Contradictions between nuclear-weapon states and non-nuclear-weapon states*

Apart from the P5, there are quite a number of other parties, for example, the US allies and partners, or Global South. All those countries also have their own attitude towards what is going on in nuclear arms control. There is a new factor, namely Treaty on Prohibition of Nuclear Weapons (TPNW) which is well alive and actually some of the Russian allies are signatories to it like Kazakhstan. It means that there is a growing frustration with the way major powers have been solving the nuclear-related issue for decades. And even some countries say that nuclear risk reduction should not be a substitution for actual nuclear disarmament. In this context it is important to once stress that the Article VI of the NPT says not only about nuclear disarmament but also about general and complete, conventional, disarmament.

THE FUTURE OF NUCLEAR ARMS CONTROL REGIME: WHAT IS NEXT?

What is next for nuclear arms control regime? Now the future looks grim and dark as the major players hardly will be able to bridge the gaps in their priorities and in their perceptions in the upcoming years. However, it should not be this way.

The priorities of major nuclear players are obviously different. China waits for everyone to further disarm. France has main desire to be as unbound by any international agree-

ment as possible. For the UK it is quite ambiguous, but they are currently increasing their nuclear arsenal like China. For Russia, the priorities are numerous, as well as for the US.

However, the Russian idea of the *strategic equation* is a very important idea because it helps to find a way to establish a set of agreements of different nature that will cover all the things that are considered strategic.

> ***"At the strategic dialogue meetings with the US, Russia has presented numerous proposals on the draft framework on the eventual on the future arms control arrangements. It is broad and ambitious, but still realistic and balanced. The underlying idea is to jointly develop a new, what I would call, strategic equation taking into account all factors affecting strategic stability, including emerging kinds of weapons prospective technologies, as well as new political realities... We want this equation to cover not traditional strategic arms, such as [intercontinental ballistic missiles] ICBMs, [submarine-launched ballistic missile] SLBMs, and heavy bombers with their respective ordnance, but also all nuclear and non-nuclear weapons that are capable of accomplishing strategic tasks... Thus we have proposed identifying weapons that pose a threat to the national territory of each side taking into consideration quantities and qualitative aspects of the balance of forced between Russia and its allies on one hand and the United States and its allies on the other regarding both nuclear and conventional weapons, as well as the specifics of their deployment".***
>
> **Russian Deputy Foreign Minister Sergey Ryabkov**
> **November 30, 2020**
> *Source: https://interfax.com/newsroom/top-stories/70491/*

> ***"When the global situation continues to deteriorate, we want Russia and the US, [as countries] bearing special responsibility for maintaining international security, to sit down at the negotiating table to come up with a new security equation that will take into account all strategic stability factors and modern military technologies".***
>
> **Russian Foreign Minister Sergey Lavrov said in an interview with TASS**
> **December 30, 2020**
> *Source: https://tass.com/politics/1241279*

The US attitude is slightly different. Apart from the need to somehow engage China in arms control with Russia, the main concern for the US is non-strategic nuclear weapons, or tactical nuclear weapons or basically nuclear weapons that are not covered by any arms control treaty so far. There was actually an effort to somehow begin this process, because when START I was signed, there was also an agreed understanding that there will be limits on submarine-launched cruise missiles, which were 880. But this is probably the only one example. We also had the presidential nuclear initiatives of the early 1990s where basically nuclear disarmament was achieved in a sub-strategic domain, but it was unverifiable. It is also important to know that geography plays an important role in the attitude to arms control, and while the US enjoy much more stable neighborhood, Russia is located in Eurasia which has been a place for huge wars throughout the history of humankind, and Russia itself has been invaded quite a number of times and for many times has been engaged in hybrid wars as well.

"Arms control does not exist in a vacuum. This is not an end in itself, but merely a means of stabilizing military-strategic parity. It is a tool for reducing the risk of armed conflict between nuclear powers. For Russia, however, the main threat is not just, or primarily, the number of warheads on intercontinental ballistic missiles and the armament of heavy bombers. This is only part of a broader picture in which a hotbed of tension has been created right on our borders, threatening to escalate into a major war.

And, therefore, the issue is not arms control. Carthage, the former European security system that made it possible for the NATO tumor to spread, must be destroyed. And the only topic that makes sense to discuss is what will replace it. And this discussion should not be focused on individual bricks or separate pitfalls but on the whole.

References to the experience of the first Cold War do not apply. At that time, nuclear missile potentials developed uncontrollably, in the absence of any agreements or mutual understandings. During the Cuban Missile Crisis, there was neither the Partial Nuclear Test Ban Treaty, nor the NPT, nor the chain of Soviet-American agreements on notification of actions involving nuclear forces of 1987-1989.

<...>

If we accept compartmentalization now, we will get a sluggish discussion around the same topics. All this without the prospect of reaching any solutions because the current U.S. administration is incapable of fulfilling agreement. We observed this with previous administrations. And this means that, with a certain probability, not only now, but also in the future, any understandings reached with the US administrations will be half-hearted and will not resolve a single major block of our concerns.

The alternative is a holistic approach proposed by Russia in 2020-2021. Security guarantees for Russia with a focus on curbing NATO's harmful activities along the perimeter of Russian borders; arms control covering all elements of the strategic equation – these are the key factors affecting the state's security.

<...>

What Russia is offering today in the realm of arms control is an ambitious, positively charged agenda. But this is a set lunch, not a choice of dishes from the menu according to someone's (sometimes far from us) taste. The willingness to discuss all issues holistically is our strict precondition".

Against Compartmentalization
Evgeny Buzhinsky, Vladimir Orlov, Sergey Semenov
Source: https://pircenter.org/en/editions/against-compartmentalization/

Another important thing to consider is that while *all nuclear* for the Americans is perceived as the future of nuclear arms control, there is a growing understanding that conventional capabilities, missile defenses and space should be a part of the equation as well. It is quite typical that in the US official documents and statements it declares pro arms control theses and says that it is ready for arms control talks with Russia without any preconditions and so on, but at the same time the US officials link the future of arms control, all the limitations and reductions regarding nuclear weapons, with the need to preserve the US superiority in the conventional domain, in space domain, in cyber domain, etc. One can only imagine how it looks from Moscow or from Beijing.

FOOD FOR THOUGHT

Another thing that should be considered is that for arms control to be alive we need people that know what arms control is to be alive and how to work in this domain. One of the biggest threats that one can imagine is that we will lose the institutional tradition of arms control. In this context it would be right to mention the 1973 US-Soviet Agreement on the Prevention of Nuclear War. Some people can say that it is most successful arms control treaty because we have no nuclear war; others can say that this Treaty makes no sense because it provides for nothing and that there are no deliverables. However, it was a very important sign of the attitude between the two countries as important as the statement that nuclear war cannot be won and cannot be fought. But it is more important than, for example, the G20 statements about the non-admissibility of threat of nuclear use, which sounds a bit strange when nuclear deterrence is based on threat. And as far as there are no direct negotiations on future of arms control, it was crucial that people who are in charge of nuclear policies in Washington, in Moscow, in Brussels, in other capitals in the world, they are very specific about what they are saying, what they are not saying, and what they are publishing. Declaratory policy is important for sure. But declarations also affect the way the states perceive each other. And this is probably the only way to survive until the new era of arms control will re-start again after tomorrow.

Another important thing is self-restraint. Even US President Kennedy (1961-1963) argued back in the 1960s that he was deterred from actions during the 1962 Cuban Missile Crisis by quite a limited number of the Soviet nuclear weapons. Now both Russia and the US have large arsenals. It is debatable whether they can destroy the whole planet or only several of its parts, but the damage that can be posed by the existing nuclear arsenals is still huge. Whether we need more, it is questionable; whether we need less is also questionable, because all-out nuclear destruction is not the only scenario, and to make nuclear deterrence to work you not only need the capabilities, transparency, and arms control as well, but you also need credible capabilities, credible doctrines, credible scenarios of use of nuclear weapons under every set of circumstances. This sounds quite terrifying or even dangerous, and it is rightly so. Focus on strategic deterrence in Russia or integrated deterrence in the US to some extent helps us to ensure that we will deter each other, we do not engage in a direct warfighting. We have capability to match each other on each level without resorting to all-out nuclear war immediately.

The problem with such an attitude is that we develop not only a very gradual escalation capability but also very comfortable capability to cross over the nuclear threshold once we reach it. Hopefully, we will not see it in our life and any anywhere. But to prevent it from happening we need arms control and risk reduction. It does not really matter whether one is a part of another or vice versa. ■

Dmitry Stefanovich

Russia-US Strategic Stability in 2024 and beyond

1. ***Strategic stability* does not equal international *security*,** and it fits adversarial relationship well. However, *strategic defeat* narratives do not help to preserve them both.

2. Main **task of strategic stability** is to remove incentives for a first nuclear strike. As we have limited understanding of what can explicitly lead to a nuclear use by a nuclear power, and the escalation dynamics cannot be fully managed, we should speak about, basically, preventing any direct armed conflict between nuclear superpowers. This is to some extent a shared understanding per January 3, 2022, P5 Statement.

3. Possible ***incentives for a first nuclear strike*** are based on threats that can be put in three provisional baskets: *offensive*, *defensive*, *combined*. First relates to the possible offensive action by the adversary that will make you own arsenal non-usable (this might include attacks, kinetic and non-kinetic, against NC3), second – to the enhanced defensive capabilities of the adversary that are being developed in a way that can undermine your retaliatory strike capability. The *combined* basket takes the best (or the worst) of the both previous ones, and, well, this is what we have at our table these days. However, we also can have a smaller basket, or a bag, near the baskets mentioned: that is, a symbolic, messaging role for a first nuclear strike, likely a very limited one. Overall, it seems, all the incentives do not seem to be a bolt from the blue' kind of thing, as they will require several technological and operational steps, and very probably an ongoing military conflict. However, reversing escalatory trends would also demand very real steps.

4. **Strategic stability and strategic (or integrated) deterrence** are related. Through the *full spectrum cross domain* activities meant to enhance strategic deterrence one tries to prevent a course of actions by the adversary that might lead to a conflict. However, the very same activities might be seen as destabilizing by the adversary, and, in turn, force him to pursue steps that, meant as a deterrence messaging, will in fact be seen as threatening. Thus, despite the intention to deter destabilizing actions we might see an even more rapidly and dramatically destabilizing dynamics. This means that

strategic deterrence operations should include a very robust messaging (or even *interpreting*) element, and extra steps must be taken to ensure that the message is received and understood. Also, the idea that, for example, nuclear deterrence can be restored through nuclear use, is a very dangerous one.

5. The logic of the two previous sections suggest that there is a relationship between **strategic stability and arms race** (arms race stability remains a thing). Indeed, both the idea to remove incentives for a first strike through enhancing your own offensive and defensive capabilities, as well as engaging in deterrence messaging through actual actions (e.g., deployments, patrols, tests) provides a fertile soil for action-reaction based dynamics for several rounds. Every round of these actions and reactions will make the situation less stable and harder to reverse.

6. And here comes the solution: **strategic stability and arms control** (in the broadest terms). To prevent an indefinite action-reaction spiral transparency and, in due time, limits might be the only possible tool. Of course, it is possible to think of *a strategically stable* situation base on extreme ambiguity and huge arsenals, but such stabilization will hardly survive for a prolonged period, especially in a situation with numerous actors involved.

7. **Strategic stability and disarmament** are somewhat different domains, however, the lower the levels of arsenals (including but not limited to nuclear) that provide for a stable situation, that better it is for the international security.

8. Finally, what can be done about a ***three-body problem?*** Well, current strategic friendship between Russia and China has some arms control at its foundation, this means that the value is well understood. Moreover, we have a common understanding, although an extremely broad one, on the global strategic stability. Now it is up to the US to find some sort of useful measures that can be embraced by China eventually.

9. Coming back to the first section, under current environment it seems that no arms control measures, and no strategic stability-specific discussions can be expected between Russia and the US if there is no interest in Washington to address and resolve the broader security issues. At the same time, some guardrails for the strategic domain remain in place. Hopefully, we will survive long enough to see another era of ambitious hard arms control being embraced by the great powers as a measure to keep the ongoing competition from spiralling into an actual confrontation and war.

January 29, 2024

Source: https://pircenter.org/en/editions/5-2024-strategic-stability-in-russia-us-relations-at-the-current-stage/

PAPER 13.

2010 NEW START: PROVISIONS AND ACHIEVEMENTS[62]

Anatoly Antonov

DRAFTING THE TREATY

In 2006, during the Group of Eight (G8) Summit in Saint Petersburg, the presidents of Russia and the United States agreed to begin the Russian-American dialogue on the future of the expiring 1991 Strategic Arms Reduction Treaty (START I) and a new treaty to replace it.

A new treaty was needed for the following reasons. START I was due to expire in 2009. Although, in theory, there were no limits on extending it for successive five-year periods, the parties to the Treaty regarded such renewal as unadvisable and unfeasible for a number of reasons. START I had been concluded between the Soviet Union and the United States, and, given the breakup of the USSR, its title had to be changed. As the United States had denounced the Anti-Ballistic Missile Treaty (ABM Treaty), extending START I, which was inherently linked with the ABM Treaty, was almost impossible from the legal standpoint. There was also a huge gap between the arms limits stipulated under START I and the real stockpiles (START limits had been set rather high, while the parties agreed much lower levels in their preliminary plan). Finally, the participation of Belarus, Ukraine and Kazakhstan in START I was justified only as long as they continued to hold some of the strategic offensive facilities and weapons after the dissolution of the Soviet Union. But by the early 2000 all the nuclear warheads had been withdrawn from their territory and delivery vehicles mostly destroyed or repurposed. Moreover, Belarus, Kazakhstan, and Ukraine had joined the Nuclear Nonproliferation Treaty (NPT) as non-nuclear-weapon states even in 1990s. The new treaty needed to address the reduction and limitation of the strategic offensive arms (SOA) of the two powers, Russia and United States.

There is no doubt that Belarus, Kazakhstan and Ukraine deserve highest praise for their contribution to START I implementation and the fulfilment of their commitments under the Lisbon Protocol of 1992. Without this, START I would not have been able to play its historic role to the extent it did. The responsible choice these countries made to remove the nuclear weapons from their territory in a coordinated way and to join the NPT as non-nuclear-weapon states not only enhanced their security, but also contributed to their strategic stability in general. On December 4, 2009, the presidents of Russia and the United States confirmed in a joint statement the assurances of security for Belarus, Kazakhstan and Ukraine agreed under the Budapest Memoranda of December 5, 1994[63].

[62] This Paper is based on the monograph: Антонов А.И. Контроль над вооружениями: история, состояние, перспективы / А. И. Антонов. – М. : Российская политическая энциклопедия (РОССПЭН) ; ПИР–Центр , 2012. – 245 с. The following pages of the monograph were translated from Russian into English by PIR Center: 40-53 as well as some excerpts on the pages 54, 56-57, 61-62. – Editor's Note.

[63] Совместные российско-американские заявления в связи с завершением срока действия Договора о сокращении и ограничении стратегических наступательных вооружений // Официальный сайт Президента России, 4 декабря 2009 г.

Speaking of the reasons and context for developing a new START, it is important to note that a simple termination of the START I without a replacing agreement would have considerably undermined the control regime with regard to Russian and American strategic arms. It was especially undesirable, given that the Strategic Offensive Reductions Treaty (SORT), another strategic arms treaty that was in effect along with START I, contained no provisions for verification and data exchange. A new START, with appropriate definition of scope and specific conditions, could ensure a comparable and predictable development of Russian and American arsenals in the foreseeable future and would help to strengthen the SOA control regime.

However, over two years of ineffectual consultations with the negotiating team of the George W. Bush administration (2001-2009) did not yield any constructive outcomes. The Americans would only agree to minor extensions to SORT's terms and conditions, while reducing the controls to transparency and trust-building measures. The talks eventually picked up steam only after the change of the US administration.

On April 1, 2009, the presidents of Russia and the US made a joint statement at a meeting in London regarding negotiations on further reductions of strategic offensive arms, starting off bilateral talks between the two governments to develop a new comprehensive and legally binding agreement for SOA reduction and limitation to replace START I[64].

On July 6, 2009, in Moscow, the presidents of Russia and the United States signed the Joint Understanding for the START Follow-on Treaty, which set out the key elements of the future agreement[65].

The US and Russian presidents Barack Obama (*on the left*) and Dmitry Medvedev (*on the right*) signing the New START

Source: open data

[64] Совместное заявление Президента Российской Федерации Д. А. Медведева и Президента Соединенных Штатов Америки Б. Обамы относительно переговоров по дальнейшим сокращениям стратегических наступательных // Официальный сайт президента России, 1 апреля 2009 г.
[65] Совместное понимание по вопросу о дальнейших сокращениях и ограничениях стратегических наступательных вооружений // Официальный сайт президента России, 6 июля 2009 г.

Following intense negotiations, a year later after their commencement, New START was signed on April 8, 2010, in Prague as the Treaty Between the United States of America and the Russian Federation on Measures for the Further Reduction and Limitation of Strategic Offensive Arms.

FOOD FOR THOUGHT

New START was not drafted from scratch. It drew on an extensive historical legacy, adopting the best and proven measures and practices from previous documents, especially START I. Of course, many aspects of START I reflective of the previous historical period and a different nature of Russia-US relations had to be substantially revised and adapted to the modern reality. This is an important lesson to learn that treaties on arms reduction and limitation should be developed based on the principle of continuity.

NEW START OVERVIEW

New START was negotiated to replace START I. In accordance with its terms and conditions, the entry into force of the new treaty also terminated SORT. Thus, New START replaced at once two previous SOA treaties that had been simultaneously in force for several years: START I and SORT. It was settled that New START would remain in effect for ten years unless it were replaced earlier by a successor SOA treaty, and If the parties agreed to extend New START, it could have been renewed for a five-year period.

Under New START, seven years after its entry into force, Russian and American SOA capabilities shall not exceed the following limits [66]:

- 700 deployed intercontinental ballistic missiles (ICBMs), submarine-launched ballistic missiles (SLBMs), and heavy bombers;
- 1550 warheads on deployed ICBMs, SLBMs, and heavy bombers;
- 800 deployed and non-deployed ICBM launchers, SLBM launchers, and heavy bombers.

So, the parties agreed to reduce the total warheads by a third (SORT capped them at 2200) and more than halve the maximum number of strategic delivery systems (1600 was the limit under START I and no limit set by SORT). Russia insisted on the lower end of the range for delivery vehicles (due to Russia's SOA condition and its capability to develop them), while the United States insisted on the upper limit. As a key principle, New START, like SORT before it, imposed no constraints on upgrading existing and developing new strategic offensive weapons.

It is necessary to explain how the New START addressed the issue of installing conventional warheads on ICBMs and SLBMs. The previous START did not prohibit such assemblies (they were considered altogether impractical). In the course of the New START talks, the American side kept trying to include provisions that would either directly allow deployment and combat use of such weapon systems or put them entirely outside the scope of the treaty. But Russia refused to accept that.

[66] Договор между Российской Федерацией и Соединенными Штатами Америки о мерах по дальнейшему сокращению и ограничению стратегических наступательных вооружений // Официальный сайт Президента России, 8 апреля 2010 г.

Strategic offensive arms	Russia	US	New START limit
Deployed ICBMs, SLBMs, and heavy bombers	**521**	**882**	**700**
Warheads on deployed ICBMs, SLBMs, and heavy bombers	**1537**	**1800**	**1550**
Deployed and non-deployed ICBM launchers, deployed and non-deployed SLBM launchers, deployed and non-deployed heavy bombers	**865**	**1124**	**800**

New START aggregate numbers of Russian and US strategic offensive arms (as of February 5, 2011)

Source: https://pircenter.org/wp-content/uploads/2022/09/A_Antonov__monografia.pdf

Even more so, regardless of the initial fierce resistance put up by the US, Russia eventually succeeded in incorporating stipulations that conventional ICBM and SLBM warheads, if any were to be manufactured, should be counted within the limits established under New START with the same rule applied to their delivery vehicles. Besides, such systems should be subject to the full-scale verification process under the Treaty.

So, while not directly banning the production of conventionally tipped ICBMs and SLBMs, the negotiated compromise did not allow the United States to perform any activities related to such systems entirely uncontrolled or unrestrained by New START.

As for other strategic offensive systems converted to conventional warheads, for example, as in the case of converting nuclear-powered submarines and heavy bombers to

Heads of the Russian and the US delegations during the negotiations on New START Anatoly Antonov (on the left) and Rose Gottemoeller (on the right)

Source: open data

conventional-armed carriers, the provisions of New START that Russia had insisted on including there, guaranteed effective control over these weapons, including ways of making sure that they would not be reconverted and would remain incapable of employing nuclear weapons.

A few words need to be said about the problem of the *return potential* under New START. There was an objective structural asymmetry between Russian and American strategic offensive arms. The United States had more nuclear weapons than Russia in terms of the number of warheads and delivery vehicles. This was why Russian New START negotiators tried not only to narrow this gap, but to erode Washington's capability to leverage its return potential, i.e., to ramp up, in a crisis, the number of combat-ready ICBM and SLBM warheads with delivery vehicles to match.

It is important to emphasize that the return potential is primarily a function of available delivery vehicles that are obviously a precondition for being able to use warheads. Stockpiling unlimited numbers of warheads alone is almost pointless. The number of warheads that can be fitted onto delivery vehicles depends on their combined maximum payload capacity. If the number of delivery vehicles is limited, accumulation of excessive warheads makes no sense and entails huge expenditure.

The limit set under New START of 800, for a total number of deployed and non-deployed ICBM and SLBM launchers and heavy bombers puts a lid on the return potential of the United States, preventing it from rapidly increasing the number of deployed delivery vehicles with non-deployed ones.

COUNTING RULES

Under the New START, the parties agreed to limit both SOA delivery vehicles and warheads. This was the approach implemented in START I. However, the New START rules for counting warheads were fundamentally different from START I: ICBM and SLBM warheads were counted based on the real payload of a specific deployed missile. The New START counting rules for ICBM and SLBM warheads were similar to those under SORT. And although SORT did not specify such rules *de jure*, the parties thereto abided by them *de facto* as they implemented the Treaty. Therefore, New START, for the first time in the history of SOA reduction negotiations, legally stipulated the counting of *operationally deployed warheads*.

Many opponents of this counting rule accused Russian negotiator that they simply accepted the American formula. But this was not quite what really happened, to put it mildly. Russia proposed to put limits not only on actually deployed warheads, but also on deployed strategic delivery systems. Limitations on the most dangerous delivery vehicles would in practice ensure that the principle of equal security for both parties should be fulfilled. Besides, with the really controlled restriction on the return potential and the real operational procedures for handling missile systems, the rules also limited the maximum number of launchers, including those used for testing and launching payloads into space.

New START attracted a lot of criticism regarding its rules for counting warheads carried by heavy bombers. Each deployed heavy bomber was to be counted as having only one

warhead, while in reality heavy bombers could carry up to 20 air-launched nuclear cruise missiles. With such rules, New START opponents argued that most of aircraft nuclear weapons could be counted as non-deployed.

The new rules for counting heavy bomber warheads could be based on some valid military and strategic considerations. The agreement between the parties to understate the *weight* of the strategic air force can be explained by the understanding of their role in nuclear operations.

VERIFICATION AND TELEMETRY

New START provided for an effective verification regime adapted to modern realities of that times.

New START included the following measures to ensure verification of compliance and transparency:

- use of national technical means of verification;
- inspection activities;
- exhibitions;
- exchange of notifications;
- exchange of telemetric information on ICBM and SLBM launches.

The New START verification system was based on the regime developed under START I, but in a more simplified and cost-effective way. For example, compared to START I, the new Treaty mandated fewer types of inspections, leaving only two, and reduced their annual quotes down to 18 inspections a year. Type One inspections (the most intrusive) were to be conducted at facilities that might contain deployed strategic offensive arms. Type Two inspections followed a more simplified procedure and were to be conducted at facilities with only non-deployed strategic offensive arms. Importantly, New START verification process no longer included the continuous monitoring of ICBM production for mobile launchers.

In the course of the New START drafting, there were major debates over the need to keep the procedure, introduced by START I, for exchanging telemetry information on ICBM and SLBM launches. In formulating its position on dropping the telemetry exchange provision, the Russian side invoked several reasons. Firstly, New START had no limitations on parameters that could be verified by telemetry, such as throw-weight and number of warheads that can be loaded on a missile as required by START I. Secondly, telemetry data could be used for the benefit of improving the missile defense system of the United States.

Nevertheless, in the interest of transparency and trust, the parties agreed that telemetry would be provided for no more than five ICBM and SLBM launches a year (annually, Russia conducted at least ten ICBM and SLBM launches, while the United States did up to five). It was important for Russian side to avoid providing to the US telemetry on launches of new developed ICBMs and SLBMs.

As a result of the talks, the parties agreed to include the right of the launching party to select the ICBM and SLBM launches for which telemetry data would be provided. Specif-

ic launches (not more than five), on which telemetric information would be exchanged, was to be agreed within the framework of the Bilateral Consultative Commission (BCC) on a parity basis. ICBM and SLBM tests, on which no telemetry should be provided, were allowed to use any methods of broadcasting missile in-flight information, including encryption. Under the agreed terms and conditions, Russia should provide telemetry data on the same types of missiles as previously provided under the 1991 Treaty. This excludes the possibility of handing over launch telemetry on new ICBMs and SLBMs.

During talks, the parties developed procedures that would not allow the United States to access telemetric information that could be used in the interests inconsistent with Russia's security. New START limited the amount of shared telemetry data associated with the operation of ICBM and SLBM stages before the separation of the payload bus. In addition, telemetry provisions did not require the parties to exchange such sensitive parameters as the acceleration and separation timing of missile stages. On top of that, the parties included an agreed statement that the exchange of telemetric information was designed to help forge a new strategic relationship between Russia and the US, without undermining the potential of their strategic offensive arms. This statement was a political limitation that implies that sharing of telemetry data should not contribute to developing America's missile defense system and, if necessary, provides an option to minimize such exchanges.

Considering the above, the agreed provisions help to:

- demonstrate Russia's willingness to cooperate and ensure transparency regarding SOA matters in the new environment;
- substantially limit, in comparison with the previous START I, the amount of telemetric information on ICBM and SLBM launches that Russia had to share with the United States.

INTERRELATIONSHIP BETWEEN STRATEGIC OFFENSIVE ARMS AND STRATEGIC DEFENSIVE ARMS

The preamble of the New START recognized the interrelationship between strategic offensive arms and strategic defensive arms and that this interrelationship would become more important as strategic nuclear arms were reduced. This concept, although less explicitly, run through the entire text of the treaty and annexes thereto.

> ***"The United States of America and the Russian Federation, hereinafter referred to as the Parties, Believing that global challenges and threats require new approaches to interaction across the whole range of their strategic relations... RECOGNIZING the existence of the interrelationship between strategic offensive arms and strategic defensive arms, that this interrelationship will become more important as strategic nuclear arms are reduced, and that current strategic defensive arms do not undermine the viability and effectiveness of the strategic offensive arms of the Parties..."***
>
> **New START**
> **2010**
> *Source: https://www.nti.org/wp-content/uploads/2021/09/new_start_treaty.pdf*

The notion of the interrelationship between SOA and missile defense was not new. Back in the late 1960s, Soviet and American governments realized that unilateral uncontrolled development of missile defense systems posed a major obstacle to nuclear disarmament. Eventually this led to the signing of the ABM Treaty in 1972. This interrelationship has always been included in SOA treaties as a reference to the parties' obligations under the ABM Treaty. It was missing only in SORT because six months before it was signed, the United States had already announced their intention to withdraw from the ABM Treaty.

New START was not intended to impose restrictions on the development of the American missile defense system. The presidents of Russia and the United States agreed from the start that the Treaty would focus, like its precursors, exclusively on strategic offensive arms. Missile defense was regarded as a separate subject of the bilateral dialogue. At the same time, Russia could not ignore an event as consequential as the termination of the ABM Treaty. That was why Russian negotiators insisted, quite fairly, that New START should have a legally binding statement regarding the interrelationship between strategic offensive arms and strategic defensive arms and its increasing importance for SOA reduction.

The most significant concept, however, included in the preamble is that current strategic defensive arms did not undermine the viability and effectiveness of the strategic offensive arms of the parties. This wording reiterates, to a degree, the well-known legal principle of fundamental change of circumstances which was initially assumed as the basis for the Treaty. This was a clear signal to the United States that Russia would reduce strategic offensive arms only if it were sure that the US missile defenses did not undermine its nuclear deterrent potential. This view was recorded in no uncertain terms in the unilateral statement of the Russian Federation that in case of qualitative and quantitative build-up in the missile defense system capabilities of the United States that could threaten Russia's strategic nuclear forces, Russia would be justified in withdrawing from the New START.

The United States accepted the legal obligation to neither convert nor use ICBM and SLBM launchers for placement of missile defense interceptors therein, and, vice-versa, not to upgrade interceptor launchers for using ICBMs and SLBMs. Additionally, the New START verification regime was scoped to cover all the converted silo launchers of ICBMs located at Vandenberg Air Force Base (2nd missile defense positioning area).

NEW START BENEFITS

"New START is the contribution of Russia and the United States to stronger global security, nonproliferation regime, and promotion of nuclear disarmament in accordance with Article VI of the Nuclear Nonproliferation Treaty. Under the New START, the reduction of strategic offensive arms will be an irreversible, verifiable and transparent process. Considering the principles of equal rights, parity and indivisible security embedded in it, the Treaty becomes, in a way, the golden standard of reaching an agreement on the military policy dimension of international relations".

Russian Foreign Minister Sergey Lavrov
Plenary session of the Conference on Disarmament
March 1, 2011
(Unofficial translation)
Source: https://www.mid.ru/ru/press_service/video/vistupleniya_ministra/1656749/

Of course, the New START, as any other SOA treaty, was a compromise solution. However, on the whole, it can be argued that New START was based on a mutually acceptable balance of the parties' interests and did not, like some previous deals, offer unilateral advantages to the United States. Summing up the above, the following benefits of the New START can be indicated:

- New START was based on a simpler and more cost-effective concept – proposed by Russia and accepted by the United States – which enabled further progress towards deeper reductions of nuclear weapons without compromising Russia's security.

- Given the demise of the ABM Treaty, New START and the documents associated with it recorded the legally formalized statement of the interrelationship between strategic offensive and defensive arms. The limitations on converting ICBM and SLBM launchers to accommodate missile defense interceptors and vice-versa were included in the Treaty itself.

- The stipulated limits on warheads and delivery vehicles were on the whole acceptable for Russia.

- The scope of the Treaty included conventional strategic offensive arms that were also subject to the same limits as nuclear arms in terms of warheads and delivery vehicles.

- New START no longer contained the disadvantageous requirement of START I for special monitoring and verification of Russian mobile ICBM launchers.

- The new verification regime was much more adapted to the modern realities and streamlined compared with the START I.

- There was no more perimeter and portal continuous monitoring (PPCM) at the Votkinsk missile production plant.

- The negotiated scope of verification activities did not include nuclear warhead storage facilities.

- Simplified conversion and elimination procedures. Specifically, the United States accepted Russia's request to remove the provision requiring American inspectors to be present on-site during SOA elimination.

- Limited sharing of telemetric information, the parameters of telemetry data exchanges were more favorable for Russia.

Of course, New START, as well as any other treaty, cannot fully addressed all the issues. Like START I, it did not provide a satisfactory solution for the challenge of long-range sea-launch cruise missiles (SLCMs). There was no ban on non-nuclear strategic offensive weapons. There was clearly a need to provide better controls over the return potential, more robust wording for the SOA/ABM interrelationship, and refine it into a higher-quality and more comprehensive agreement. And there is no doubt that further negotiations on nuclear disarmament would continue in the future. It is only a question of when they will be held and what subject they will focus on.

New START contains no provisions that could restrict the development of the Russian strategic nuclear forces in accordance with the long-term plans. It did not require mandatory elimination or conversion of the strategic offensive arms currently operated by the Russian Armed Forces. Russia had no problems with adopting new advanced missile systems. Meanwhile, the New START verification regime – simplified and less costly – retained sufficient scope to monitor the condition and evolution of the US strategic forces. Therefore, it can be concluded that in terms of strategic relations with the United States, the new Treaty ensured an adequate level of transparency, predictability and mutual trust.

REVIEW OF THE US SENATE'S RESOLUTION OF ADVICE AND CONSENT TO RATIFICATION OF THE NEW START. POSITION OF THE STATE DUMA AND THE FEDERATION COUNCIL OF THE RUSSIAN FEDERAL ASSEMBLY

On December 22, 2010, the US Senate approved by a majority vote of 71 to 26 the resolution to ratify the 2010 New START, namely the Resolution of Advice and Consent to Ratification[67]. Some media outlets even claimed that New START was allegedly ratified by the parties with some amendments. This was not true; it was ratified and came into force as exactly the same text that had been signed by Russian President Dmitry Medvedev and US President Barack Obama in Prague on April 8, 2010. And this was something that was essential for maintaining stable Russian-American strategic relations and international security in general.

The US Senate's resolution of ratification included a number of conditions, understandings and declarations, subject to which the senators provide their *advice and consent* to the ratification of the Treaty.

The conditions subsection was binding upon President of the United States. It emphasized the requirement to formally confirm that all the four phases of the Phased Adaptive Approach to missile defenses in Europe shall be implemented and that the United States would be able to complete all its active missile defense programs. The US administration was thus directly instructed to continue the quantitative and qualitative build-up of its missile defense system, regardless of the concerns and cautions, which had been more than once expressed by Russia and recorded in its unilateral statement on missile defense made in connection with the signing of New START.

Conditions subsection also demanded that the US President should seek an agreement with Russia to reduce non-strategic (tactical) nuclear weapons in order to eliminate the disparity between the parties in this respect. Moreover, it even set the timing for commencing such negotiations – not later than one year after the entry into force of the New START. Recognizing the need to ascertain with confidence the number and security of Russian tactical nuclear weapons, the US Senate urged the President to engage Russia with the objectives of establishing appropriate cooperative measures, but also of providing United States or other international assistance to help the Russian Federation ensure the accurate accounting and security of its tactical nuclear weapons[68].

[67] New START Treaty: Resolution Of Advice And Consent To Ratification // US Department of State Archived Content, December 22, 2010.
[68] New START Treaty: Resolution Of Advice And Consent To Ratification // US Department of State Archived Content, December 22, 2010.

"...draws the attention of the global community to the fact that unilateral development and deployment by the United States of America of the global missile defense system and the potential use of new weapon systems for this purpose may destroy the decades-lasting system of strategic stability in the area of nuclear armaments... the State Duma believes that it is necessary to closely monitor the deployment of the global missile defense system of the United States of America considering the geographic location of its components, the number and velocity characteristics of interceptor missiles and potential space components, keeping in mind the need to ensure Russia's strategic deterrence capability".

Russian State Duma Statement
January 25, 2011
(Unofficial translation)
Source: https://pircenter.org/wp-content/uploads/2022/09/A_Antonov__monografia.pdf

The Russian State Duma set out its position on tactical nuclear weapons in extensive detail in its Statement Regarding the Issues of Reduction and Limitation of Strategic Offensive Arms.

"The State Duma believes that any further steps to reduce and limit strategic offensive arms and tactical nuclear weapons shall be subject to unconditional implementation of New START and compliance with all its principles and provisions.

The State Duma considers that the placement of the tactical nuclear weapons of the United States of America outside the US territory is unjustified and inconsistent with the nature of the contemporary relations in the Euro-Atlantic area.

The State Duma believes that the matters concerning the potential reduction and limitation of tactical nuclear weapons should be considered in combination with other issues of arms control, including the deployment of the missile defense system, plans to develop and deploy strategic delivery vehicles with conventional payloads, the danger of space militarization, and the drastic qualitative and quantitative imbalance in conventional weapons, based on the need to maintain strategic stability and strictly abide by the principle of equal and indivisible security for all.

The State Duma calls upon the United States of America to relocate its tactical nuclear weapons back to its territory, discontinue the preparations for its employment that involve non-nuclear-weapon states, and completely remove the infrastructure located in other states that enables rapid deployment of such weapons".

Russian State Duma Statement
January 25, 2011
(Unofficial translation)
Source: https://pircenter.org/wp-content/uploads/2022/09/A_Antonov__monografia.pdf

The US Senate's resolution elaborated at length on the fact that the provisions of the New START preamble (which, *inter alia*, stated the interrelationship between strategic offensive arms and missile defense as well as the impact of conventionally tipped ICBMs and SLBMs on strategic stability) did not entail any legally binding commitments for the United States and Russia. It was hard to argue otherwise on a formal basis, since, in inter-

national law practice, the preamble was meant to set out the objectives and principles of the treaty, but not the legal obligations of the parties.

The Russian Federal Law on the New START Ratification (Article 4, paragraph 1) clearly said that the provisions of the New START preamble had unquestionable significance for understanding the intentions of the parties at the time of the signing, including the content of the agreed conditions and understandings, without which New START would not have been signed, and it should therefore be fully taken into account by the parties in implementing New START.

It was for a reason that, in the US Senate's resolution of ratification, the statement about the New START preamble' *special* status was included under the missile defense heading of the understandings subsection. The point is that, when the resolution was being drafted, the preamble's recitals that realistically stated the interrelationship between strategic offensive arms and strategic defensive weapons caused a great deal of frustration among Republican senators who actively supported deployment of the global missile defense system. It is important to remember that Russia and the United States agreed to include this statement in New START back in 2009 when they signed the Joint Understanding for the START Follow-on Treaty.

Considering the above, the Russian Federal Law (Article 2, paragraph 5) stipulated, among the conditions subject to which New START should be implemented, the requirement to take into consideration the existence of the interrelationship between strategic offensive arms and strategic defensive weapons, the growing importance of such interrelationship as strategic nuclear arms are reduced, and the need to make sure that the strategic defensive arms [i.e. missile defense] of one party should not undermine the viability and effectiveness of the strategic offensive arms of the other party to New START[69]. The State Duma, in turn, emphasized in its Statement Regarding the Issues of Reduction and Limitation of Strategic Offensive Weapons that it considers the recognition by the Russian Federation and the United States of America of the interrelationship between strategic offensive arms and strategic defensive weapons stated in New START to be a fundamental precondition for ensuring the Treaty's viability and efficacy[70].

The American senators reserved the right for the United States to withdraw from the New START if there was an expansion of strategic arsenals in countries other than Russia. That was a clear case of double standards: on the one hand, Americans retained an option for an unrestricted production and deployment of the new types of conventionally armed strategic offensive weapons, and, on the other, insisted that it was unacceptable for other nations to build up similar arsenals.

The President of the United States was also advised to consider making new international agreements with Russia for further reduction of nuclear weapons consistent with

[69] Антонов А.И. Контроль над вооружениями: история, состояние, перспективы / А. И. Антонов. – М. : Российская политическая энциклопедия (РОССПЭН) ; ПИР–Центр , 2012. С. 58.
[70] Там же.

national security requirements and alliance obligations of the United States. In this regard, Article 5 of the Federal Law on New START Ratification sets forth Russia's conceptual approach to further reductions of nuclear armaments: "President of the Russian Federation will make the decision to conduct negotiations on further reduction and limitation of nuclear weapons, considering the progress in implementing New START, its principles and provisions, as well as the status of such weapons in the United States of America and third party states, and in conjunction with other national security objectives of the Russian Federation"[71]. The US Senate's resolution of ratification also stated the intention of the United States to carry out the modernization and regular replacement of its strategic conventional and nuclear delivery systems.

On the whole, the US Senate's resolution appeared to be an attempt to *tweak* the key understandings achieved in the course of the New START negotiations. The senators basically embedded a restatement of the Treaty's most sensitive provisions that was different from what was approved by Barack Obama. Such one-sided interpretation was biased and aimed at tilting the carefully calculated balance of interests that was the foundation and principal hallmark of the 2010 New START. ■

[71] Там же. С. 62.

PAPER 14.

BAN ON NUCLEAR TESTS AS A MEANS OF NONPROLIFERATION, ARMS CONTROL AND DISARMAMENT

Dmitry Stefanovich

Basically, a nuclear test is an explosion of a nuclear device that can take place in different domains: under water, in the atmosphere, on the ground, in space, or under the ground. The world has seen hundreds of those carried out by different countries.

Why do countries conduct nuclear tests? It relates to the whole question on why they need nuclear weapons. The short answer is that they need nuclear weapons for deterrence. Even though the Americans used nuclear weapons for warfighting in 1945 when two atomic bombs were dropped on Japan, no one used nuclear weapon for war since then, but they were quite extensively tested. There are nuclear weapons, and we have thermonuclear weapons, or we have A-bombs or H-bombs. There are different designs, different delivery systems – artillery, mines, aircraft, missiles, torpedoes, and all other sorts of things. There are rather limited numbers of actual tests of the delivery systems and nuclear weapons together; usually they

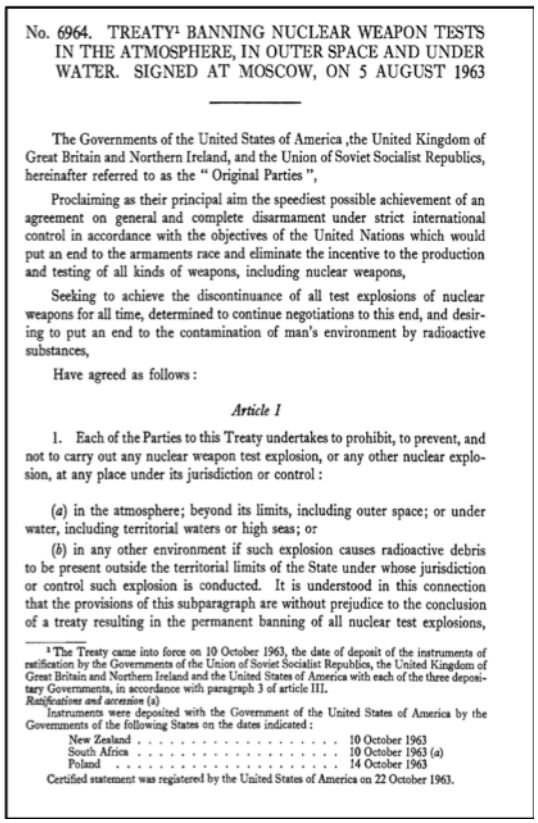
Processes of nuclear testing in different domains

Source: open data

are tested separately, especially now with the nuclear test moratorium. Nuclear tests are needed to ensure that the design of the nuclear explosive device is workable and that the weapon will do what it is created for. Besides, studying the effects of nuclear explosions can help us to understand not only how to conduct military operations in a nuclear environment, which is a complicated task if not impossible, but also how to protect the civil populations, which is a mission that is quite hard to fulfill.

So, history shows that nuclear testing has helped us to understand the effects of nuclear weapons and not to use them. This is somewhat counterintuitive because the basic idea of a nuclear test is just to have a workable device, and the idea of a nuclear test involving military personnel is to be able to conduct operations. Even now, despite the statement that a nuclear war cannot be won and must never be fought[72], militaries around the world train to operate under environment of the use of weapons of mass destruction (WMD). Why is this so? While major countries do not believe in winning nuclear war, they also have no intention of losing one. And this is what stabilizes the strategic situation.

1963 LIMITED TEST BAN TREATY (LTBT): PROVISIONS AND MEANING



No. 6964. TREATY[1] BANNING NUCLEAR WEAPON TESTS IN THE ATMOSPHERE, IN OUTER SPACE AND UNDER WATER. SIGNED AT MOSCOW, ON 5 AUGUST 1963

The Governments of the United States of America ,the United Kingdom of Great Britain and Northern Ireland, and the Union of Soviet Socialist Republics, hereinafter referred to as the " Original Parties ",

Proclaiming as their principal aim the speediest possible achievement of an agreement on general and complete disarmament under strict international control in accordance with the objectives of the United Nations which would put an end to the armaments race and eliminate the incentive to the production and testing of all kinds of weapons, including nuclear weapons,

Seeking to achieve the discontinuance of all test explosions of nuclear weapons for all time, determined to continue negotiations to this end, and desiring to put an end to the contamination of man's environment by radioactive substances,

Have agreed as follows :

Article I

1. Each of the Parties to this Treaty undertakes to prohibit, to prevent, and not to carry out any nuclear weapon test explosion, or any other nuclear explosion, at any place under its jurisdiction or control :

(*a*) in the atmosphere; beyond its limits, including outer space; or under water, including territorial waters or high seas; or

(*b*) in any other environment if such explosion causes radioactive debris to be present outside the territorial limits of the State under whose jurisdiction or control such explosion is conducted. It is understood in this connection that the provisions of this subparagraph are without prejudice to the conclusion of a treaty resulting in the permanent banning of all nuclear test explosions,

[1] The Treaty came into force on 10 October 1963, the date of deposit of the instruments of ratification by the Governments of the Union of Soviet Socialist Republics, the United Kingdom of Great Britain and Northern Ireland and the United States of America with each of the three depositary Governments, in accordance with paragraph 3 of article III.
Ratifications and accession (a)
Instruments were deposited with the Government of the United States of America by the Governments of the following States on the dates indicated :

New Zealand	10 October 1963
South Africa	10 October 1963 (*a*)
Poland	14 October 1963

Certified statement was registered by the United States of America on 22 October 1963.

The US Secretary of State Dean Rusk, Foreign Minister of the Soviet Union Andrei Gromyko and Sir Alec Douglas-Home signed the Moscow Treaty on August 5, 1963. The photos show United Nations Secretary General U Thant (*on the center*) and First Secretary of the Communist Party of the Soviet Union Nikita Khrushchev (*on the right*).

Source:https://www.cvce.eu/en/obj/signing_ceremony_for_the_limited_test_ban_treaty_moscow_5_august_1963-en-547bd257-b8e1-45f6-85ba-275c7413646d.html

[72] For the very first time this tenet was proclaimed by President Ronald Reagan and General Secretary of the Communist Party of the Soviet Union Mikhail Gorbachev at their summit in Geneva in 1985. It was reiterated in January 2022 by the leaders of China, France, Russia, the UK and the US. – Editor's Note.

The Soviet Union frequently used the so-called *peaceful nuclear diplomacy*, or diplomacy of denuclearization. One of the reasons was that the perceived power of the Soviet Union and Warsaw Pact Organization member states in the conventional domain was overwhelming and capable of protecting the socialist countries. Besides, there was an understanding that there are quite a number of countries in the world that did not support *the nuclear Damocles sword*, which can end all life on Earth quite immediately. So, on August 5, 1963, Great Britain, the US and the USSR signed in Moscow the Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water, or Limited Test Ban Treaty (LTBT), or Partial Test Ban Treaty (PTBT). Sometimes it is also referred to as the Moscow Treaty.

LTBT was quite an achievement, as it prohibited nuclear testing in the atmosphere, in outer space and under water. Underground tests were still allowed. It limited the number of tests that were conducted with special effects that could have been seen and that provided quite serious effects for the environment and for the local populations in the regions where they were tested. LTBT was quite important for arms control. It did not prevent countries from refining their nuclear capabilities, but it provided room to limit the direction of the refinement of these capabilities through underground tests explicitly, and so-called *peaceful nuclear explosions*, which basically used nukes to achieve some economy and industry goals.

The Moscow Treaty is still in force, and while sometimes there are accusations of non-compliance, countries do not conduct nuclear tests in the atmosphere or in the outer space because they cannot be hidden. One of the interesting cases is the so-called *Vela Incident* where an alleged nuclear test happened over the ocean, and it was noticed from space.

> **FOOD FOR THOUGHT**
>
> *In 1979, the Vela Incident took place: unidentified double flash of light detected by an American Vela Hotel satellite on September 22, 1979, near the South African territory of Prince Edward Islands in the Indian Ocean. Some specialists believe that it was a joint nuclear test carried out by South Africa and Israel. But it is still unproven.*

Another important factor of tests that were done before LTBT came into force were the space tests. Those contributed to our better understanding of radiation in outer space, which is hugely important for the future development of outer space capabilities. The data on the way the nuclear explosions affect the environment in different domains is also used until today and helps us to refine not only nuclear weapons but a number of other technologies.

1996 COMPREHENSIVE NUCLEAR-TEST-BAN TREATY (CTBT): ACHIEVEMENTS AND FAILURES

After the LTBT, countries were negotiating the issue of a comprehensive test ban to avoid any nuclear explosions, including underground. This was actually a much more important means of nonproliferation as well as disarmament because with underground tests states could still refine and develop new nuclear capabilities. Moreover, new nuclear-weapon states could emerge. So, on September 10, 1996, the Comprehensive Nuclear-Test-Ban Treaty (CTBT) was signed in New York.

The Comprehensive Nuclear-Test-Ban Treaty (CTBT) bans all nuclear explosions, whether for military or peaceful purposes. It comprises a preamble, 17 articles, two annexes and a Protocol with two annexes.

- Annex 1 to the Treaty lists States by geographical regions for the purposes of elections to the Executive Council.
- Annex 2 to the Treaty lists the 44 States that must ratify the Treaty for it to enter into force.
- Protocol Part I describes the functions of the International Monitoring System (IMS) and the International Data Centre (IDC).
- Protocol Part II sets up the procedures for on-site inspections.
- Protocol Part III deals with confidence-building measures.
- Annex 1 to the Protocol lists the facilities comprising the IMS network.
- Annex 2 to the Protocol lists the characterization parameters for IDC standard event screening.

Source: https://www.ctbto.org/our-mission/the-treaty

The following Annex-2 States have ratified the treaty:

Algeria	Argentina	Australia	Austria	Bangladesh	Belgium
Brazil	Bulgaria	Canada	Chile	Colombia	Democratic Republic of the Congo
Finland	France	Germany	Hungary	Indonesia	Italy
Japan	Mexico	Netherlands (Kingdom of)	Norway	Peru	Poland
Republic of Korea	Romania	Slovakia	South Africa	Spain	Sweden
Switzerland	Türkiye	Ukraine	United Kingdom of Great Britain and Northern Ireland	Viet Nam	

The following Annex-2 States have not yet ratified the treaty:

China	Democratic People's Republic of Korea	Egypt	India	Iran (Islamic Republic of)	Israel
Pakistan	Russian Federation	United States of America			

Status of the CTBT

Source: https://disarmament.unoda.org/wmd/nuclear/ctbt/

It was a well-designed Treaty despite the interesting fact that it never tried to address the common definition of a nuclear weapon (neither does the Nonproliferation Treaty (NPT)), but it never came into force. The main reason is that it had a provision that there should be 44 countries that must sign and ratify it for it to come into force; those are nuclear weapon states and the countries that have significant nuclear expertise.

"Members of the State Duma unanimously supported the adoption of the bill on the withdrawal of ratification of the Comprehensive Nuclear-Test-Ban Treaty. The Chairman of the State Duma, leaders of the State Duma factions and almost all members of the State Duma are the co-authors of the bill… "For 23 years we have been waiting for the United States of America to ratify the Treaty (CTBT). But Washington used its double standards and irresponsible approach towards global security issues and still has not done that", – emphasized Vyacheslav Volodin, Chairman of the Russian State Duma… "The Russian Federation will do everything to protect its citizens and ensure that global strategic parity is being maintained", – concluded Vyacheslav Volodin".

Bill de-ratifying the Comprehensive Nuclear-Test-Ban Treaty was adopted in the first reading
The State Duma of the Federal Assembly of the Russian Federation
October 17, 2023
Source: http://duma.gov.ru/en/news/58091/

"On November 3, 2023, Russia sent the United Nations a notice of its withdrawal of the ratification of the Comprehensive Nuclear-Test-Ban Treaty (CTBT)… The law amending the law ratifying the CTBT took effect on November 2… "Russia remains a signatory to the CTBT with all rights and obligations it entails, [and] continues to participate in the work of the UN Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization", – the Russian Foreign Ministry said. "We intend further to comply with the moratorium on nuclear testing, which was introduced more than 30 years ago. However, the United States must understand conducting field tests, for which testing infrastructure in Nevada has reportedly been prepared, will force us to respond in kind… The most destructive position on the Treaty has been taken by the US, which has for nearly a quarter of a century been avoiding its ratification under contrived pretexts… This could not go on forever. With the US pursuing a profoundly hostile course on our country [Russia], maintaining the erstwhile imbalance in approaches to the CTBT between Moscow and Washington proved no longer possible…".

Interfax
November 3, 2023
Source: https://interfax.com/newsroom/top-stories/96191/

Among those are some countries who signed but did not ratify, like the US, China, Israel; and others who did not even sign it, like India, Pakistan and the DPRK. Russia ratified the Treaty in 2000 but in 2023 revoked the ratification. Now it is on the same page with the US and China, which signed the CTBT but have never ratified it. It is a rather tricky situation. The interesting fact is that previously within the NPT-related Nuclear Five, three of those had the status of a state party which signed and ratified (Great Britain, France and Russia until 2023) while the minority has signed but not ratified (the US and China). Now

it is vice versa. Obviously one of the greatest problems in this regard was the ratification process in the US. Typically, American presidential administrations have said that they will support the CTBT even despite the opposition of the US Congress, but they usually stop even making efforts to ratify it.

Even though the CTBT never entered into force and the organization established by the Treaty – the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) – is not formally working, the Preparatory Committee for the CTBTO has been functioning since 1996, and the International Monitoring System (IMS) has been formed as well. IMS is basically a network of sensors that monitor everything: atmosphere, seismic activity, radioactivity. And now it seems that it is impossible to carry out a nuclear test that will not be seen by anyone. Russia and the US are among the most important contributors to the system. The Monitoring Center in Vienna gathers all the information required and needed, and despite the fact that sometimes the information from some sensors is not transferred, generally, it is a very important contribution, especially for nonproliferation. However, the IMS can be used for other tasks, for example, to observe missile related activity and to conduct some other intelligence activities, and this is a challenge that prevents or limits the desire of some countries to cooperate with the IMS.

What is the future for the CTBT? Unfortunately, so far it is more likely that CTBT will be dissolved altogether than that it will enter into force. However, the current situation, which is somewhat in limbo, might continue indefinitely.

NUCLEAR TESTS MORATORIUM IN PRACTICE

In the 2000s, the only country that carried out a nuclear test was the DPRK. Other countries are quite serious about upholding the test moratorium. However, this does not prevent countries from keeping their nuclear test facilities in good shape, modernizing them and so on. It is one side of the same coin. You do not test, but you keep yourself ready to test in case other countries start to engage in such an activity. Somehow it contributes to the strategic balance.

- **The United States** conducted **1.032** tests between 1945 and 1992.
- **The Soviet Union** carried out **715** tests between 1949 and 1990.
- **The United Kingdom** carried out **45** tests between 1952 and 1991.
- **France** carried out **210** tests between 1960 and 1996.
- **China** carried out **45** tests between 1964 and 1996.
- **India** carried out **1** test in 1974 (*it was characterized as a peaceful nuclear explosion*).
- **India** conducted 2 tests in 1998.
- **Pakistan** conducted 2 tests in 1998.
- **The Democratic People's Republic of Korea** conducted nuclear tests in 2006, 2009, 2013, 2016, and 2017.

Data source: https://www.un.org/en/observances/end-nuclear-tests-day/history

Unfortunately, sometimes specialists talk very bravely about nuclear testing without thinking about the consequences. The test moratorium may come under growing pressure

in decades to come. Why? Well, there are new developments, there are new designs, and there are new spare parts – the non-nuclear parts of a nuclear explosive device or a nuclear warhead or nuclear bomb. So, these parts evolve and, unfortunately, the situation may come where, to have it working reliably, a full-scale test will be needed. We are not there yet, even though lobbying groups in favor of nuclear testing exist in every nuclear-weapon state. Some countries, for example, like India, even have publicly stated concerns (at least from some experts there) that their nuclear weapons are not good enough. And that is why they need new testing. However, as test moratorium stands, it looks like no one is really interested in being the first one to resume nuclear testing. Unfortunately, it seems that once some country carries out a nuclear test, a lot of other states will follow suit.

So far, the test moratorium and the IMS have been developing within the scope of the CTBT, despite the fact that the CTBT has not entered into force. These effects provide the framework of a ban on nuclear tests that serves as a very real mean of nonproliferation and arms control. On the disarmament side, it is more complicated because there was the idea that eventually the nuclear arsenals will degrade due to the time factor, and without testing they will need to be dismantled, and eventually the world will end up at *nuclear zero*. But the problem is that a non-nuclear world is not the "current world minus nuclear weapons" as some people say. It is a much more complicated process, and nuclear weapons still remain a factor of international security. That is why countries have been looking for ways to keep them in a good shape without nuclear testing.

VIOLATIONS, ACCUSATIONS, SIMULATIONS IN THE HISTORY OF NUCLEAR TESTS BAN

Despite the fact that a test moratorium exists, there have been continuous accusations – and sometime mutual accusations – about some sort of violations. To understand why this happens, we need to speak a bit about how the nuclear arsenal is being maintained without nuclear tests.

There are quite a number of sophisticated techniques and technologies used that involve lasers, X-ray machines, and huge supercomputing power. Also, there are so-called hydronuclear tests. The main idea is to develop an environment within a nuclear explosive device or a warhead that resembles the actual nuclear test environment without launching a fusion reaction that ends up in a proper yield, basically, without having an explosion. There is the idea that all these tests should have a zero yield, but there are not mutually agreed way to measure it. Zero yield is a good standard, but actually it is hard to achieve if you want to maintain a stockpile. But it is a good way of bashing each other because the blame game is very important in current international politics. Saying that someone does not adhere to the zero yield or to the test moratorium is a good way to portray anyone as a bad guy. This is done by many countries. Whether these simulations work is another question, but, it seems to be good enough.

Practice shows that even within the best arms control treaties (like New START or the ABM Treaty), from time to time countries engaged in activities that looked like violations. However, it is important to know that when there was enough political will and when the countries were interested in keeping this or that treaty alive, they walked the extra mile to either reverse the course of actions or explain why this or that action was not a violation. Because there are no perfect treaties, cases that border on violation will always happen.

The problem with the CTBT is, as long as the Treaty has not entered into force, there is no verification mechanism, and you cannot verify compliance or even non-compliance for that matter.

Can we do something about this? I think the only way to address it is to engage in better transparency. Sometimes it can be unilateral transparency. There are some American initiatives about countries trying to have joint teams of scientists present at the subcritical tests. It does not seem that this will fly at the moment, especially given the fact that it is not something like a written offer or a formal invitation from the US, but eventually, why not? Previously, states have used to have lab-to-lab cooperation. Something similar could happen in the nuclear testing domain. It is hard, but person-to-person relations are crucial for arms control.

NUCLEAR TESTS RESUMPTION: NOW LESS UNTHINKABLE?

Will the world see new nuclear tests? Of course, it is quite a possibility.

▶ *Political factors*

The international environment is rapidly deteriorating. So, there might be tests for political reasons. One way to do it is basically to achieve some sort of escalation control, to demonstrate that you can resort to nuclear use, and your nuclear weapons explode during a conflict. Another mean would be – even if there is no conflict – just to demonstrate that you have this capability, and this is something that can undermine nuclear nonproliferation. Also, for political reasons, nuclear testing can happen if country X is engaged in a conflict, but its adversary somehow plays down its capability, so that country X carries out a nuclear test showing that it has this capability and is ready to use it.

The Russian attitude to revoke the ratification of the CTBT is also quite political. But the Russian de-ratification of the CTBT is not a reason for nuclear testing, because all other provisions of the CTBT that Russia adheres to are in place, including the test moratorium and participation in the activities of the IMS. But still Russia wants to demonstrate through diplomatic means that we are on the same page with the Americans, who have not ratified the CTBT since 1996.

So, among the political reasons for possible nuclear testing can be escalation control, status or nuclear capability demonstration, as well as signaling that you have parity.

▶ *Technical factors*

There is also a much bigger basket of technical reasons for conducting nuclear tests. One of these might be that the technical progress is going on and state X wants to show that it has new technologies, new machinery or just thoughts about new capabilities. So, the parts in the nuclear explosive device are different, and despite the huge volumes of data and huge computing power that exists, especially in the US, in Russia and to some extent in China, eventually the world can come up with a situation when a proper nuclear test would be needed to ensure that nuclear arsenal works appropriately. While this seems to be a distant future, things might change in a decade or so.

Also, new designs of nuclear weapons can be a factor. Now states have a more or less evolutionary development, but it is possible to imagine a situation in which the next generation of nuclear scientists comes up with some interesting ideas and proposals, and both political and military leadership would be interested in testing these new designs that would promise military might. This is, unfortunately or fortunately, a traditional course of action when something new appears in the military domain. What is important is that, if someone achieves this capability, other nuclear-weapon states will try to follow suit.

Moreover, from the technical perspective, nuclear testing might be required to test the resilience of this or that equipment. Whether this equipment will be for our planet, for space or even for some other planet, or the moon is unknown – this sounds a bit like science-fiction, but, again, it is something that definitely can happen. The developments in science and technology and international relations suggest that it is not something impossible; it is a foreseeable scenario. Of course, it will not happen now and will take decades and decades to unfold, but this is something doable.

CONCLUSION

It is important to make an effort to keep things manageable, for example, to establish a Nuclear-Five-wide suspension of the test moratorium just to figure out how current weapons work, and if nuclear deterrence is effective. If the Nuclear Five has this suspension of moratorium, there are other countries that will follow suit, and it will affect the whole nonproliferation regime in a very sad way. Also, as generations change, there are quite a limited number of people who have actually seen a nuclear test. In this case we need a live atmospheric nuclear test filmed in 4k with a great sound, so everyone will understand how epic this thing is, because there is nothing on this planet comparable to nuclear weapons in their destructive power.

But it is not an easy task not only from the technological point of view, but from the political and diplomatic point of view to have a proper nuclear test. Quite a number of international documents should cease to exist. And the biggest issue is that there are quite a number of capable actors who would be interested in testing their own devices or even developing their old nuclear capability. A ban on nuclear testing is definitely an important part of nonproliferation, arms control, disarmament efforts, while nuclear tests themselves can undermine all these three issues. ■

PAPER 15.

CYBERSECURITY AS AN ELEMENT OF THE STRATEGIC STABILITY EQUATION

Elena Chernenko

Russia and the US have now over ten years of experience of efforts to try to enhance security and strategic stability by trying to establish cooperation in cyberspace. Within this period, there were three stages to do it.

The first was undertaken in 2013, which was called by the press the *cyber pact* between Russia and the USA. Why so? One can guess that because those two countries were very advanced in terms of their cyber capabilities, and this was the first such set of agreements between two major players in this field. The second effort happened in 2017, and it can be called the *Cyber Fata Morgana* because it was so short-lived, and it did not even last a week. Then, the third effort was undertaken in 2021, and it was a double effort. First, cyber became part of the *strategic stability equation*. Russia introduced cyber as a part of the strategic stability talks officially, but also the two countries, Russia and the US, re-established consultations on cybersecurity issues separately from those talks and strategic stability. So, it was a broad effort. That was why it was called *the cyber détente* between Russia and the US.

A BIT OF TERMINOLOGY

There are differences of approaches in the US and Russia regarding cybersecurity. Cybersecurity is a term that is mostly used by the US and other Western countries but also globally in the world. What is meant by that is the confidentiality, integrity, and availability of systems, networks, and data. Russia adds another aspect to this – the content. So, Russia cares not only about the confidentiality, integrity, availability of systems, networks, and data, but also about the content. So, for example, how is the information space used to influence the opinion of citizens of other countries, when it comes to elections? How are social networks used to organize popular unrest, revolutions, and so forth? Now, critics in the West do not like this term *international information security*, they say that Russia and other countries who use it are aimed at censorship and more government regulation of content on the Internet. Russia from its part says that it is important to protect against information wars as well.

For many years, there was a clash of those terminology approaches, and of this whole ideology behind them. However, when the two countries sat down and worked on their first agreement, in particular 2013 *cyber pact*, they had to find a compromise. How would they call the sphere in that they were going to cooperate? They introduced a very difficult term: *security in the field of information and communication technologies and of their use*.

Within this term, one can see the US part: *security in the field of technologies*, and then the Russian part: *and of their use*.

Some other terms will be useful for understanding of this whole area. There is a very good effort that was undertaken by Russia and the US to make a common glossary. It is a *Critical Terminology Foundations* report. There are actually two reports, one issued in 2011 and another in 2014 by the Lomonosov State University and its Information Security Institute, and the East-West Institute.

- **Cyberspace** is an electronic medium through which information is created, transmitted, received, stored, processed and deleted.
- **Critical cyber infrastructure** is the cyber infrastructure that is essential to vital services for public safety, economic stability, national security, international stability and to the sustainability and restoration of critical cyberspace.
- **Cybercrime** is the use of cyberspace for criminal purposes as defined by national or international law.
- **Cyberattack** is an offensive use of a cyber-weapon intended to harm a designated target.
- **Cyber warfare** is cyberattacks that are authorized by state actors against cyber infrastructure in conjunction with a government campaign.
- **Cyber weapon** is a software, firmware or hardware designed or applied to cause damage through the cyber domain.

Critical Terminology Foundations
Source: https://gssd.mit.edu/search-gssd/site/critical-terminology-foundations-updated-60693-thu-12-18-2014-2035

THE 2013 CYBER PACT BETWEEN RUSSIA AND THE USA

So, the first effort by Russia and the US to boost cooperation in cyberspace was made ten years ago in 2013 during the first meeting of US President Barack Obama (2009-2017) and Russian President Vladimir Putin (2000-2008; 2012-present) at the margins of the G8 Summit in June 2013. This was where they signed a historical document: a joint statement *On a New Field of Cooperation in Confidence Building*[73] and then also a package of intergovernmental agreements.

The joint statement said that Russia and the US recognized that threats to or in the use of information and communication technologies (ICTs) including political, military, and criminal threats, as well as threats of a terrorist nature, and that they were the most serious national and international security challenges which Russia and the US faced in the 21st century. Both affirmed the importance of cooperation between the two countries for enhancing bilateral understanding in the area of cybersecurity. The two leaders created several mechanisms to enhance that cooperation.

First, they decided to deepen the high-level dialogue and create a working group within the framework of the Russian-American presidential commission. That presidential com-

[73] Joint Statement by Presidents of the United States of America and the Russian Federation on a New Field of Cooperation in Confidence Building // Official Website of the Russian President, June 17, 2013.

mission existed before and had several working groups on different aspects of cooperation, and cyber was added as the last one to that. It was supposed to meet on a regular basis starting in the US, then half a year later in Russia, then again in the US, and then again in Russia – so twice a year – to hold consultations on issues of mutual interest and concern in the field of ICTs.

> ***"We, the Presidents of the United States of America and the Russian Federation, recognize the unprecedented progress in the use of Information and Communications Technologies (ICTs), the new capacity they create for the economies and societies of our countries, and the increasing interdependence of the modern world. We recognise that threats to or in the use of ICTs include political-military and criminal threats, as well as threats of a terrorist nature, and are some of the most serious national and international security challenges we face in the 21st century. We affirm the importance of cooperation between the United States of America and the Russian Federation for the purpose of enhancing bilateral understanding in this area. We view this cooperation as essential to safeguarding the security of our countries, and to achieving security and reliability in the use of ICTs that are essential to innovation and global interoperability".***
>
> **Joint Statement by Presidents of the United States of America and the Russian Federation on a New Field of Cooperation in Confidence Building**
> **June 17, 2013**
> *Source: http://en.kremlin.ru/supplement/1479*

Second, another mechanism created by the two presidents in June 2013 was a communication channel between the Computer Emergency Response Teams (CERTs). Those CERTs exist in almost every cyber-advanced country. Those were special entities responsible for monitoring Internet traffic 24/7, looking for incidents, trying to prevent them from escalating, and protecting governmental structures. Therefore, in order to create an information exchange and ensure effective protection of critical information systems, a communication channel between the Russian CERT and the US CERT was organized.

Third, hotline was established between the nuclear risk reduction centers of the Russian Federation and the US. Those nuclear risk reduction centers existed long before that to prevent a nuclear war and to have direct communication channels between Moscow and Washington. In order to facilitate the exchange of urgent messages that can reduce the risk of misunderstanding, escalation, and conflict, it was decided to add specialists on cyber issues to those specialists in nuclear domain who worked in those nuclear risk reduction centers. That was very important because it was considered that threats in cyberspace could be serious enough to escalate and endanger the security of the two countries so much that they were basically compared to nuclear risks. And that was where, for the first time, nuclear and cyber nexus really came up in the US-Russia relationship.

Fourth, the direct communication link between high-level officials in the Kremlin and the White House was created to manage potentially dangerous situations arising from events that may carry security threats in the use of information and communication technologies. It was important to have specially designated people both in the Kremlin and the White House who would always know whom to call, with whom to connect in case

there was an emergency, an unclear situation, or in case there was information that, for example, a cyberattack was coming from the territory of the US and it hurt infrastructure on the territory of Russia. Whom to call? With whom to speak? Specially designated high-level representatives were needed to be connected with each other in case of such emergencies.

Those agreements did not last very long. They actually exist until today, but so far they have been more on paper than in real life.

Above-mentioned working group, the first mechanism that was created within the bilateral presidential commission, met in November 2013 on the US ground. High-ranking representatives from Russia from different structures starting with the Russian Security Council, the Russian Foreign Ministry, the Russian Ministry of Defense, and other designated agencies flew to the US and met with their American counterparts. The idea was that this working group would try to elaborate on those agreements that were signed in June 2013 and to work out an even bigger framework agreement to enhance cooperation between Russia and the US in cyberspace. Unfortunately, as events unfolded, that was the only meeting of the working group. They never met again.

The CERT communication channels and the crisis communication hotline between the nuclear risk reduction centers were used even after 2014. One of the cases when they were used was in 2014 during the Sochi Olympic Games when there was a cyberattack against critical infrastructure of Russia connected to the Sochi Olympics. There was an impression that it originated from the territory of the US. Those channels were used several times, but publicly one knows only about this Olympic case. However, they were not used as often and as effectively as intended in 2013 when that agreement was signed.

The direct Kremlin-White House channel was used, at least, during the 2016 Democratic National Committee (DNC) hack crisis but it did not really help to overcome the differences. In 2016, during the US presidential elections, there was a hack into the infrastructure of the Democratic National Committee where several thousands of letters were taken out from the emails of several representatives of the DNC and then published online first using a leakage site and then distributed to the media. According to the US, that was the work of the Russian intelligence services which Russia always denied. Several reports of the US intelligence services claimed to prove that this a campaign to interfere in the US presidential elections originated in Russia to help Donald Trump win over Hillary Clinton. The Russian government always denied this and said that using this Kremlin-White House communication channel, they provided the US with technical and other information to show that Russia had nothing to do with this campaign. Unfortunately, it was not possible to establish a common version of what happened there.

After 2014 when the conflict around Ukraine started, Russian-American cooperation in cyber domain basically ended. 2013 agreements do exist until now. But the working group, one of the main mechanisms created in 2013, suspended its work because Washington, after the conflict around Ukraine erupted, stopped cooperation within the whole bilateral presidential commission. And the working group on cyber was one of those that ceased to exist at that time.

2017 CYBER FATA MORGANA

In 2017, it was a second attempt to revive cooperation in cyberspace between Russia and the US. It was so short-lived that one can only say there was a *Fata Morgana*.

In 2017, President Vladimir Putin met with Donald Trump (2017-2021) in Hamburg, Germany, at the margins of the G20 Summit. They decided to re-establish of the cyber working group. During a press conference Vladimir Putin said it could work, for example, on the prevention of cyber terrorism, of interventions into a country's internal affairs, etc. Donald Trump said as well that there would be a working group on cyber cooperation with Russia that could discuss different aspects of the cybersecurity.

Experts were trying to think what the concrete deliverables could be, but it was over so fast that one could not believe it. Several influential congressmen reacted with harsh criticism to these plans accusing Russian intelligence agencies of having interfered in the 2016 presidential elections, and Donald Trump walked everything back.

> ***The fact that President Putin and I discussed a Cyber Security unit doesn't mean I think it can happen. It can't – but a ceasefire can,& did!".***

Donald Trump in his Twitter
July 10, 2017
Source: https://www.theguardian.com/us-news/2017/jul/10/close-to-the-stupidest-idea-critics-flail-trump-russia-cyber-security-plan

The main result was that this working group was not re-established. One must say that this piece of news tweeted by Donald Trump surprised, of course, many officials in Moscow. They were trying to downplay it a bit, so there were no very critical public statements. But they were rather contemplating about this in private dialogue, saying that this was unexpected and deplorable.

> *The two countries decided they wanted to try that without public attention, without press involvement, without having a formal mechanism. Try to just have delegations from different agencies meet. They were about to meet in the beginning of 2018 in Geneva for informal consultations on what can be done to enhance cybersecurity between the two countries. The Russian delegation arrived in Geneva and checked into their hotel, as it is known, but the US delegation never came. In the last moment the White House decided to cancel those talks. It has not been known so far what the official reason was for that. There is a speculation that maybe it was because of a major cyberattack that had happened in the days and weeks before that, the NotPetya attack, which, according to some experts, also originated in Russia. So, this might have influenced the US delegation and the decision-makers in the White House to call off the talks with the Russian counterparts. We do not know yet so far, but the result is the same: the working group was not established, and there were not even informal consultations during that period between Russia and the US on cyberspace".*

Elena Chernenko

There was an effort a year later to actually try to establish some kind of communication in this sphere. But efforts to hold informal consultations in 2018 were not successful.

2021 STRATEGIC EQUATION AND CYBER DÉTENTE BETWEEN RUSSIA AND THE USA

2021 presented probably the most promising attempt, and it was not only connected with cyberspace. But at that time the link between cyber and strategic stability was demonstrated at its best.

The third attempt, again, started with a meeting of the two presidents. In June 2021, Geneva summit between Vladimir Putin and his new US counterpart Joe Biden (2021-present) was held. It launched two mechanisms – consultations on strategic stability (to potentially replace the New START after it expires in 2026) and on cybersecurity. What is interesting is that, at least from the Russian view, cyberspace was put also on the table within these strategic stability talks. So, cyber became part of the *security equation*.

> ***"This security equation should take into account all factors significant for strategic stability in a comprehensive manner. It is not limited to nuclear weapons. We consider it very important to embrace the entire spectrum of both nuclear and non-nuclear offensive and defensive arms that are capable of resolving strategic tasks. I would like to draw your attention to these words that reflect the essence of the Russian position".***
>
> **Sergey Ryabkov,**
> **Russian Deputy Foreign Minister, at a briefing at the *Rossiya Segodnya* International Information Agency on arms control and strategic stability**
> **February 11, 2021**
> *Source: https://www.mid.ru/en/maps/us/1415641/*

So, new working group on strategic stability dialogue was established. It met several times and started with a broader discussion on what the two sides considered as threats for them in the strategic sphere or what steps they thought could be taken to mitigate those threats, what kind of agreements, for example, should replace New START in 2026. There were discussions on whether Russia and the US should be aimed at concluding a big new agreement or, maybe, a set of smaller agreements and unilateral steps. The US experts were talking also about other common steps that the two sides could take within the strategic stability dialogue related to cyber, not only about, for example, having a norm or a law, an agreement on non-aggression, non-attacking by cyber means control and command systems especially that were related to the nuclear forces, but also about some other steps, for example, prohibiting cyberattacks against critical infrastructure in space, because space was also one of the issues that were to be discussed within this newly created dialogue.

Cybersecurity became one of the agenda items of the strategic stability dialogue. After the summit Russia and the US also created a separate *ad hoc* mechanism for cybersecurity consultations. It was not called a working group, unlike in 2013 and 2017. This time Moscow and Washington decided simply to begin substantive consultations on the issues of mutual interest.

> ***We believe that cyber security is extremely important in the world in general, for the United States in particular, and to the same extent for Russia… What we need to do is discard all the conspiracy theories, sit down at the expert level and start working in the interests of the United States and the Russian Federation. In principle, we have agreed to this, and Russia is willing to do so".***
>
> **Russian President Vladimir Putin**
> **at News conference following Russia-US talks**
> **June 16, 2021**
> *Source: http://en.kremlin.ru/events/president/news/by-date/16.06.2021*

It was quite clear what Russia wanted from this dialogue because a little less than a year before that, Vladimir Putin made some proposals on cooperation in cyberspace with the US. Firstly, it was suggested to re-establish working group to have regular full-scale bilateral inter-agency high-level dialogue on international information security issues. Secondly, Vladimir Putin also proposed to maintain continuous and effective functioning of communication channels between competent agencies of the two states through the nuclear risk reduction centers. In 2023, agreement on a cyber incident communication channel between the nuclear risk reduction centers was concluded. That agreement is formally still in place, as it is the agreement on the communication channel between computer emergency response teams. Thirdly, Russia proposed to jointly develop and conclude a bilateral intergovernmental agreement on preventing incidents in the information space similarly to the Soviet-American agreement on the prevention of incidents on and over high seas that had been in force since 1972. Fourthly, Vladimir Putin called for enhancing a mutually acceptable format guarantees of non-intervention into a country's internal affairs including into the electoral processes by means of information and communication technologies and other high-tech methods. The format was to be discussed, but the idea was that both states would not interfere in each other's internal affairs, including elections, by cyber means.

But what did the US want from the dialogue on cyber issues? First, it had great concerns about cyberattacks, and especially about ransomware attacks. Therefore, the US wanted actions on the part of Russia to prevent attacks by hacker groups that the US thought were operating from the territory of Russia. A second idea that Joe Biden had in mind when he came to the meeting in Geneva in 2021 was to try to elaborate guarantees of non-aggression against critical infrastructure facilities in the US. Every country has its own list of critical infrastructure facilities. In the US there are for example, 16 sectors, including chemical and hazardous material industry, defense industrial base, governmental facilities, nuclear reactors, materials and waste, communication sphere, finance sphere, and so on. Russia has its own list of such critical infrastructure facilities and spheres. There is little bit less of them – only 13, but they are grouped into bigger groups.

A few weeks before Geneva summit there had been several cyberattacks on infrastructure in the US. The biggest was the Colonial pipeline hack, where a big company in the US could not operate for several days because of a cyberattack. It caused a fuel crisis, and it was quite damaging for the US economy. White House was interested in preventing such attacks. Some authorities were saying that the hackers were operating from the territory of Russia.

There were quite fast results from this new consultation group on cybersecurity established in 2021. Just three months later after the Geneva summit, the US officials announced that they saw that the number of attacks had gone down. In September 2021, Russian officials made public some information about how these consultations on cyber issues between the White House and the Kremlin were going on. For example, the two sides started much more actively exchanging information on criminal cyber groups, they had some online consultations.

It was expected that the agenda of these consultations would be expanded. Russian officials made a number of critical statements that suggested that from Russia's point of view, the agenda of these consultations was too narrow because the US only wanted to talk about ransomware distributors. Russia was interested in a broader discussion based on the proposals that Vladimir Putin laid out a year earlier. However, the US also made it clear that it was not against expanding the agenda of the consultations, at least in terms of discussing the prevention of attacks on critical infrastructure. In any case, many expected that the presidents would soon meet for a second summit, where they would be able to discuss these topics among others. But Vladimir Putin and Joe Biden had only a phone call back then. When the Russia's Special Military Operation started in 2022, the US-Russian *cyber détente* was over as the US decided to freeze strategic dialogue with Russia at all.

2021 JOINT RESOLUTION ON CYBERSECURITY

In October 2021, Russia and the US tabled a joint UN General Assembly resolution *On the Developments in the Field of Information and Telecommunications in the Context of International Security*. This shared commitment on cybersecurity was a significant change since before that Russia and the US for years had acted as competitors at the UN promoting their own resolutions on this subject and intensely fighting for votes.

The 2021 joint US-Russian resolution:

- stressed that it was in the interest of all states to promote the use of ICTs for peaceful purposes and to prevent conflicts arising from the use of those tools;
- recalled that a number of states were developing ICT capabilities for military purposes and that the use of them in future conflicts between states was becoming more likely;
- reaffirmed that voluntary, non-binding norms of responsible state behavior could reduce risks to peace, security and stability;
- noted that in the future additional binding obligations could be elaborated, if appropriate (something Russia had long advocated);
- underlined that the UN should continue to play a leading role in promoting dialogue on the use of ICTs by states and recognized the importance of the efforts made in this direction by the Group of Governmental Experts and the Open-ended Working Group on Developments in the Field of Information and Telecommunications in the Context of International Security.

For many years, the US and Russia were kind of rivals at the UN General Assembly while discussing cybersecurity issues. They used to present their own resolutions, trying to get as many votes as possible, and also to lobby against each other, trying to prevent countries from voting for their own resolution. Over the years other countries prefer to vote for both Russian and the US proposals. However, in October 2021, the two countries

presented a joint resolution. It was a compromise and a shared commitment by the two countries which was very welcomed by many states who were tired of having to decide whom to vote for and did not really want to make such a choice.

Since 1990s, states were trying to sit down and to elaborate what kind of norms could there be for states to behave responsibly in cyberspace. There are several reports that contain such norms that were developed over the years. One can call it a *cyber codex* for states. Unfortunately, all of those norms are not really implemented. In 2021, the US and Russia reaffirmed that such norms were needed for responsible behavior of states in cyberspace. And they also noted that in the future even binding obligations could be elaborated.

Russia advocated for such statements for years as Russian diplomats usually said that voluntary non-binding norms, kind of a soft law, would not really work in the cyberspace. A big universal convention on cybersecurity or an informal international information security is needed. Russia has already tabled a few drafts of such a convention. The first one was presented in 2011. Sometimes it was the only Russia to author them. The last draft was presented in 2022. It was co-authored by Russia and several other countries. The US, over the years of those negotiations at the level of the UN, were saying that no binding norms were needed because things were developing so fast in cyberspace, new technologies were emerging too rapidly, and diplomats usually were taking quite a long time to elaborate agreements or even a big convention. From American point of view, it did not make any sense to strive for a big universal binding document like a convention, it would be enough to agree on non-binding soft law norms. In the joint resolution of 2021 one can see a compromise between the two approaches.

Also, the 2021 resolution underlined that the UN should continue to play a leading role in promoting dialogue in the use of ICTs by states. It recognized the efforts made by the two UN mechanisms that were created within those years of negotiations about cyber norms for states, in particular, UN Group of Governmental Experts (GGEs) and Open-Ended Working Group on Developments in the Field of Information and Telecommunications in the Context of International Security (OEWG). Both mechanisms were competing each other while the US was supporting the GGE and while Russia was lobbying for the OEWG. Anyway, the GGE ceased to exist in 2021, when the OEWG mandate will last until 2025. In 2021, in the joint resolution the US and Russia asserted that they were looking forward to cooperating within the new mechanism.

CONCLUSION

After the Special Military Operation of Russia in Ukraine was launched, the US said there would be *no business as usual*. Washington suspended strategic dialogue with Russia both on arms control and cybersecurity issues. Since then, both countries have been accusing each other of conducting cyberattacks. Both consider each other as opponents, if not enemies, in cyberspace.

In autumn 2022 and in 2023, the US and Russia tabled competing resolutions at the UN General Assembly. Again, both resolutions passed. Many countries are unhappy with that competition in cyberspace. In their view, being most advanced countries in terms of cyber technologies the US, Russia as well as China should overcome their differences and find a compromise to make it easier to find universal solutions and to take practical steps for enhancing security in cyberspace all over the world. ■

PAPER 16.

NUCLEAR DISARMAMENT: A MULTILATERAL LEVEL

Andrey Malov

Nuclear disarmament issues are considered in various multilateral fora and decisions are taken in various multilateral formats.

MULTILATERAL DISARMAMENT MACHINERY (MDM). DISARMAMENT TRIAD OF THE UN

The UN disarmament *triad* includes United Nations (UN) Disarmament Commission, First Committee of the UN General Assembly (UN GA), and Conference on Disarmament (CD).

▶ *United Nations Disarmament Commission*

The function of the UN Disarmament Commission is to develop recommendations on the solution of urgent problems of arms control, disarmament and nonproliferation. The sessions of the UN Disarmament Commission organize their work on the basis of three-year cycles in their respective working groups (WGs). Two issues are mainly discussed:

1. recommendations for achieving the goal of nuclear disarmament and nonproliferation of nuclear weapons;
2. practical confidence-building measures (CBMs) in the field of conventional arms.

Recently, the problem of preventing an arms race in outer space has also been discussed as an independent issue.

All decisions are advisory in nature, but serious discussions are unfolding around them. Discussions on nuclear issues are unfolding between anti-nuclear activists, *moderate* countries and members of the Nuclear Five.

Proponents of a ban on nuclear weapons are quite active, often blocking compromise proposals, insisting on *filling the gaps* in the international legal framework for nuclear disarmament by developing a *nuclear convention*. They persistently promote the topic of the *humanitarian consequences* of the possession of nuclear weapons, which, in their opinion, reflects the political will of the majority of states. Attempts are being made to remove references to *strategic stability* from draft outcome documents as an indispensable condition for a step-by-step move towards a nuclear-free world. In their approaches, they operate on the provisions of the Treaty on the Prohibition of Nuclear Weapons (TPNW), which has entered into force in 2021, in the development and adoption of which they took an active part. These include most of the non-aligned countries, with the exception of India and Pakistan, and a number of Western countries.

Supporters of moderate approaches towards nuclear disarmament are mostly European countries that are under the US nuclear umbrella. They promote the idea of reasonable but sustainable nuclear disarmament taking into account strategic factors. Recently, due to the sharp aggravation of international tensions, primarily between Russia and the West, the speeches of the *moderates* have become less of an expert nature and more emotional. This is especially true for NATO countries.

The five nuclear powers – China, France, Great Britain, Russia, the US – which are bound together by a mechanism of constant consultations within Nuclear Five, or P5, are experiencing increasing difficulties in finding common approaches to key international issues, including nuclear disarmament. Previously, Russia and the United States managed to find a common line on nuclear disarmament in the face of the growing activity of anti-nuclear states, in particular, to hold joint briefings on the sidelines of the UN events, in particular, within the framework of the UN General Assembly sessions or NPT review conferences. The main emphasis in the joint briefings was placed on the practical contribution of Russia and the United States to the process of nuclear disarmament through the implementation of the agreements in the field of strategic offensive arms reduction (up to 80 percent over the past 30 years). After the deterioration of the Russian-US relations, such joint briefings stopped. However, despite the differences and contradictions, the meetings of the P5 continue.

"But after February 24, 2022, P5 coordination process under the NPT stopped to work. The Tenth NPT RevCon was the first one where the Nuclear Five did not coordinate on the NPT-related issues, on how to react to the demands of the great majority of non-nuclear-weapon states… I understand that right before and during the Conference, the US, France and Great Britain, the P3 group, coordinated their positions. They did not include Russia because of the conflict in Ukraine, and China decided not to take part as long as Russia was not invited. I understand that the Russian and Chinese delegations held meetings during the Conference, but I am not aware if they coordinated their positions as well".

Ambassador Gustavo Zlauvinen, President-designate of the Tenth NPT Review Conference, in an interview for PIR Center

Source: https://pircenter.org/wp-content/uploads/2023/02/%E2%84%961-35-2023.-The-Tenth-NPT-Review-Conference-2022-Chronicle-of-the-Failure-Foretold.pdf

▶ *First Committee of the UN GA*

First Committee of the UN GA defines the key areas of activities of states in the field of arms control, disarmament and nonproliferation for the current session of the General Assembly. Specifically, the UN GA First Committee prepares and adopts draft resolutions of the UN GA on international security, disarmament and nonproliferation, including a set of *nuclear* resolutions.

Both in the UN Commission and in the First Committee, similar contradictions are manifested. They do not allow to ensure the development of universal approaches in the field of nuclear disarmament.

▶ *Conference on Disarmament (CD)*

CD is aimed primarily at negotiating new agreements. It is one of the key multilateral formats for addressing nuclear disarmament in all its aspects. It deserves much more attention to be paid later.

In general, the stability of the UN *disarmament triad* is ensured by the interconnectedness and complementarity of its elements, their subordination to a single goal which is to ensure international security. Recently, however, a serious fragmentation of the UN disarmament mechanisms has been observed, which is reflected in a sharp decline in consensus resolutions prepared by the UN GA First Committee and adopted by the UN GA.

What are the main challenges facing the UN *disarmament triad*? The following ones can be listed:

- stalemate in the Conference on Disarmament;
- fragmentation of international arms control, disarmament and nonproliferation efforts, withdrawal of negotiation formats beyond the traditional UN framework;
- inability to agree on priorities in the field of arms control, disarmament and nonproliferation.

THE CONFERENCE ON DISARMAMENT

The Conference on Disarmament was set up in accordance with paragraph 120 of the Final Document of the 1978 10th Special Session of the General Assembly (or the United Nations Special Session on Disarmament, SSOD) as the single multilateral disarmament negotiation forum of the international community[74].

> "The General Assembly is conscious of the work that has been done by the international negotiating body that has been meeting since 14 March 1962 as well as the considerable and urgent work that remains to be accomplished in the field of disarmament. The Assembly is deeply aware of the continuing requirement for a single multilateral disarmament negotiating forum of limited size taking decisions on the basis of consensus. It attaches great importance to the participation of all the nuclear-weapon States in an appropriately constituted negotiating body, the Committee on Disarmament...".
>
> **Paragraph 120 Final document of the Tenth Special Session of the General Assembly 1978**
>
> *Source: https://digitallibrary.un.org/record/218448?ln=en*

There were several predecessors to the CD, which had been dealing with disarmament issues for almost 20 years:

- Ten Nation Committee on Disarmament (1960-1961);
- Eighteen Nation Committee on Disarmament (1962-1968);
- Conference of the Committee on Disarmament (1969-1978).

[74] Final document of the Tenth Special Session of the General Assembly, 1978 // United Nations Digital Library.

The Conference conducts its work by consensus. The Conference is now comprised of the five NPT-recognized nuclear-weapon states and 60 non-nuclear-weapon states, including states of key military significance. In addition, every year some 40 non-member states participate, upon their request, in the work of the CD. The preliminary discussions of the major issues on the CD are practically organized within *the format of three regional groups* – Western, Eastern and the Group-21 comprising the developing states. A separate entity is China, operating at the CD independently from any of the groups.

The CD meets in an annual session, which is divided in three parts of 10, 7 and 7 weeks, respectively. The first week shall begin in January. The CD is presided by its members on a rotating basis. The presidency of the CD rotates every four weeks in English alphabetical order of the names of its member states. When the UN General Assembly established the Conference in 1978, it requested the UN Secretary General to appoint his personal representative who would assist the rotating presidency. The personal representative serves as the Secretary General of the CD. Then, in order to ensure a coherent approach among the six presidents of the session to the work of the CD an informal coordination mechanism – the P6 – was established that provides for the six presidents of the session to informally meet each other usually on a weekly basis. Also on a weekly basis, the president meets informally with the three regional group coordinators and China together with the P6 (presidential consultations).

The CD is not a United Nations body as such, but it has developed a close working relationship with the UN. The UN GA stipulated that the CD adopts its own agenda, taking into account the recommendations made to it by the UN General Assembly and the proposals presented by the members of the Conference, and submits a report to the UN General Assembly annually, or more frequently, as appropriate. The CD adopts its own rules of procedure and its own agenda, taking into account the recommendations of the UN General Assembly and the proposals of its members and also a program of work. The CD also reports to the UN General Assembly annually, or more frequently, as appropriate. Its budget is included in that of the United Nations. Staff members of the Geneva Branch of the UN Office for Disarmament Affairs (UNODA) service the meetings of the CD, which are held at the Palais des Nations.

The CD and its predecessors have negotiated such major multilateral arms limitation and disarmament agreements as the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD), the Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Sea-Bed and the Ocean Floor and in the Subsoil thereof (Seabed Treaty), the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction (BTWC), the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction (CWC), and Comprehensive Nuclear-Test-Ban Treaty (CTBT).

The work of these bodies aimed at providing effective international control and covered all types of armaments and armed forces. Nevertheless, in spite of many multilateral treaties successfully negotiated by the CD and its predecessors, the 65-member body has been stalemated for the last two decades with no new agreements negotiated since the CTBT was signed in 1996.

Currently, the CD covers almost all multilateral arms control and disarmament issues. Its current agenda includes:

- cessation of the nuclear arms race and nuclear disarmament;
- prevention of a nuclear war, including all related matters;
- prevention of an arms race in outer space;
- effective international arrangements to assure non-nuclear-weapon states against the use or threat of use of nuclear weapons;
- new types of weapons of mass destruction and new systems of such weapons including radiological weapons;
- comprehensive program of disarmament and transparency in armaments.

At its initial session in 1979 the Conference on Disarmament established a list of issues for its future work on the cessation of the arms race and disarmament. This list consisting of ten subjects, therefore frequently referred to as the Decalogue, had at its top nuclear, chemical and other weapons of mass destruction, and included also other areas of disarmament and arms control, such as conventional weapons, reduction of military budgets and of armed forces, confidence-building measures, verification methods, etc. The tenth and last issue on this list was a comprehensive program of disarmament leading to general and complete disarmament under effective international control.

Decalogue of the Conference on Disarmament:

1. nuclear weapons in all its aspects;
2. chemical weapons;
3. other weapons of mass destruction;
4. conventional weapons;
5. reduction of military budgets;
6. reduction of armed forces;
7. disarmament and development;
8. disarmament and international security;
9. collateral measures, confidence-building measures, effective verification methods in relation to appropriate disarmament measures, acceptable to all parties concerned;
10. comprehensive program of disarmament leading to general and complete disarmament under effective international control.

Although the Decalogue meant to be a framework for establishing annual agendas of the CD, the very first agenda adopted in April 1979 included only items related to weapons of mass destruction with a clear dominance of nuclear issues.

The 1979 agenda of the CD contained the following six items:

1. nuclear test ban;
2. cessation of the nuclear arms race and nuclear disarmament;
3. effective international arrangements to assure non-nuclear-weapon states against the use or threat of use of nuclear weapons;
4. chemical weapons;

5. new types of weapons of mass destruction and new systems of such weapons, radiological weapons;
6. consideration and adoption of the annual report and any other report as appropriate to the UN GA.

> ***Rule 27: "At the beginning of each annual session, the Conference shall adopt its agenda for the year. In doing so, the Conference shall take into account the recommendations made to it by the General Assembly, the proposals presented by member States of the Conference and the decisions of the Conference".***
>
> ***Rule 28: "On the basis of its agenda, the Conference, at the beginning of its annual session, shall establish its programme of work, which will include a schedule of its activities for that session, taking also into account the recommendations, proposals and decisions referred to in rule 27".***

Rules of procedure of the Conference on Disarmament

1992

Source: https://digitallibrary.un.org/record/139995

This correlation between the CD agenda and the program of week is very important and delicate nowadays. Until 1992 the agenda of the CD was always adopted together with the program of work, which in accordance with the CD rules of procedure, consisted mainly of a schedule of activities of the Conference. However, after the conclusion of negotiations on the CWC in 1992, the presidency of the Conference, responding to the requests of some members, began consultations on the review of the agenda and the membership of the CD. Those consultations were intensified following the issuance of the UN Secretary General's report *New Dimension of Arms Regulation and Disarmament in the Post-Cold War Era* and, at the beginning of the 1993 session, the results were presented to the Conference by its president as the *Presidential statement on organization of work*.

Since that time the biggest problem was the adoption of the program of work with the list of priorities of the work. In 1994 and 1995 the Conference followed this practice, but the document title was slightly changed to *Presidential statement on the agenda and organization of work*. In 1996, the Conference entered the final stage of negotiations on the nuclear test ban and therefore practically limited its activity to this issue only. Accordingly, it adopted *only the agenda* for that session and, separately, a decision on the re-establishment of the *Ad Hoc* Committee on a nuclear test ban. Moreover, the president of the Conference announced that he would conduct intensive consultations with a view to develop a basis for consensus on the issue of nuclear disarmament. These consultations were continued by the successive presidents; however, they were inconclusive.

At the commencement of the CD session in 1997, some Western and Eastern European delegations proposed the elaboration of a new agenda consisting of two blocks of items related to nuclear disarmament. These delegations were of the view that such an agenda would be more balanced and more responsive to the priorities of all the members of the Conference. Moreover, they proposed the issues of the prohibition of production of fissile material for nuclear weapons or other nuclear explosive devices.

That practice has been followed since then and, formally, the agenda has been unchanged, although the item *comprehensive program of disarmament* has become a platform for addressing many other issues which, due to the divergence of views among the CD members, could not be included on the agenda as separate items. During the period of stalemate, the CD as a rule adopted the agenda but has managed to adopt its program of work only one time.

Nuclear disarmament in the work of the CD

The item *cessation of the nuclear arms race and nuclear disarmament* has been on the agenda of the Conference on Disarmament since 1979. The very first proposal on the issue was submitted by the Group of the Eastern European States and envisaged negotiations on the cessation of the production of all types of nuclear weapons and the gradual reduction of their stockpiles until their complete destruction. This proposal also envisaged the CD as a suitable forum for preparing negotiations on ending the production of nuclear weapons and their destruction. This document was followed by a number of working papers submitted by the Group of 21. In the first of these papers, the Group of 21 proposed that the CD should begin informal consultations on the elements for negotiations on nuclear disarmament and, subsequently, establish a working group for negotiations of agreements and concrete measures in the field of nuclear disarmament. Since then, at the beginning of each session the members of the Group of 21 have proposed the establishment of a subsidiary body for negotiations on nuclear disarmament. Since there was no agreement on doing so, issues related to this item were extensively discussed at the informal meetings of the Conference and then summarized and included in the yearly reports. Up until now the nuclear disarmament is the top priority for Group of 21.

When, in 1993, the Conference decided to give a negotiating mandate to the *Ad Hoc* Committee on a nuclear test ban, which resulted in a considerable intensification of work for this subsidiary body, the practice of producing the extensive summaries of discussions on nuclear disarmament was discontinued and reporting was limited mainly to the listing of submitted documents.

As of 1994, under the item *cessation of nuclear arms race and nuclear disarmament* the Conference started to consider the prohibition of the production of fissile material for nuclear weapons or other nuclear explosive devices and appointed a Special Coordinator to seek the views of the members of the Conference on the most appropriate arrangement to negotiate a non-discriminatory, multilateral and internationally and effectively verifiable treaty banning the production of fissile material for nuclear weapons or other nuclear explosive devices.

In 1995, the Special Coordinator Ambassador Ulric Shannon, a Canadian diplomat, presented his report containing a mandate for the *Ad Hoc* Committee, which was adopted by the Conference. The Conference also decided to establish the *Ad Hoc* Committee on the subject but was unable to agree on the appointment of the Chairman of this Committee and, therefore, the Committee could not be convened. The Shannon mandate played and still plays a very important role at the CD. It takes out of the scope of possible negotiations on Fissile Material Cutoff Treaty (FMCT) the already accumulated stocks of fissile material for nuclear weapons.

The developments of 1995 related to nuclear disarmament could be seen as the source of persistent problems facing the Conference on Disarmament in the years to come. Firstly, from the beginning of the 1995 session the atmosphere in the Conference was influenced by the uncertainties surrounding the preparations for the NPT Review and Extension Conference and its outcome. It was generally expected that the indefinite extension of the NPT would generate momentum for the Conference so that it could fully play its role as a negotiating forum dealing with global concerns in the field of disarmament. However, this was not the case and, on the contrary, the situation in the CD worsened due to the hardening of positions, especially on the part of developing countries which expected that, after the indefinite extension of the NPT in 1995, nuclear disarmament would be in the forefront of activities of the Conference.

When, in 1996, the Conference entered the endgame in the negotiations on the CTBT, delegations belonging to the Group of 21 intensified efforts for launching substantive work on nuclear disarmament in a systematic and organized way. At the very beginning of the 1996 session, the Group of 21 called for the immediate establishment of an *ad hoc* committee to commence negotiations on a phased program of nuclear disarmament and for the eventual elimination of nuclear weapons within a time-bound framework.

From the beginning of the 1998 session, it was evident that the Conference would not be able to engage in any substantive work without first reaching some understanding on how to address nuclear disarmament. In August 1998, following nuclear tests by India and Pakistan, the Conference decided to establish an *Ad Hoc* Committee to negotiate a treaty banning the production of fissile material for nuclear weapons and other nuclear explosive devices. The Group of 21 also stated that a satisfactory solution to the issue of nuclear disarmament would have a direct bearing on the work of the CD in the future. But despite its 1998 recommendations, the Conference was not able to re-establish the Ad Hoc Committee on the prohibition of production of fissile material for nuclear weapons.

In 2000, the work of the Conference on Disarmament became heavily influenced by the outcome of the NPT Review Conference, in particular by the 13 practical steps outlined in the final document for the systematic and progressive efforts to implement Article VI of the NPT, in which step 4 emphasized the necessity of establishing in the Conference on Disarmament an appropriate subsidiary body with a mandate to deal with nuclear disarmament. In addition, the Conference on Disarmament was urged to agree on a program of work which includes the immediate establishment of such a body, which was, in fact, a formal recognition (and acceptance) of linkages between the items on the agenda of the Conference on Disarmament and a guarantee that, for other items, first of all prevention of an arms race in outer space, the CD would also establish a subsidiary body.

The mechanism used during these years to break the deadlock over the *program of work*, namely mandating a president or a group of presidents to submit to the Conference a single (*comprehensive*) proposal on the basis of consultations with the CD members, has never brought positive results since it has been relatively easy to undermine the overall balance of any proposal by challenging some of its elements as not reflecting the particular concerns of one or a few states. Moreover, almost always such criticisms have not been followed by corresponding draft proposals to overcome the perceived deficiencies, thus effectively stalling all efforts of the drafters.

However, in 2009 such efforts finally brought results. On May 29, 2009, the CD adopted the draft decision for the establishment of a program of work for the session of that year, which, *inter alia*, provided for the establishment of the working group to exchange views and information on practical steps for progressive and systematic efforts to reduce nuclear weapons with the ultimate goal of their elimination, including on approaches towards potential future work of multilateral character. The decision also established a Working Group mandated with the negotiations of a treaty banning the production of fissile material for nuclear weapons. Regretfully, after the adoption of this decision, the Conference, instead of proceeding immediately to substantive work, as provided for in the decision, turned into endless, unnecessary and inconclusive discussions on how to organize the work of the working groups. In 2010, attempts to start work based on the 2009 program of work failed.

The Conference therefore once again reverted to the mechanism used in the previous years and agreed on a schedule of informal meetings on its agenda items during the second part of the session. However, the role of these meetings was questionable, at least. In accordance with the agreed schedule of these meetings, they were neither pre-negotiations, nor negotiations, and complemented and in no case replaced the Conference on Disarmament's on-going activities.

Since 2009, efforts of the Conference on Disarmament to work out a comprehensive agreement on the commencement of substantive work (program of work) have never succeeded. All the comprehensive and balanced proposals developed over the years have never enjoyed consensus.

Currently, the CD primarily focuses its attention on the following issues:

- cessation of the nuclear arms race and nuclear disarmament;
- prevention of a nuclear war, including all related matters;
- prevention of an arms race in outer space;
- effective international arrangements to assure non-nuclear-weapon states against the use or threat of use of nuclear weapons;
- new types of weapons of mass destruction and new systems of such weapons including radiological weapons;
- comprehensive program of disarmament and transparency in armaments.

TREATY ON THE PROHIBITION OF NUCLEAR WEAPONS

TPNW was adopted on July 7, 2017, at the conference in New York, convened in accordance with 2016 UN General Assembly Resolution № 71/258. On September 20, the Treaty was opened for signature in New York. The Treaty has entered into force in January 2021.

The text of the TPNW reflects all the key postulates for supporters of immediate nuclear disarmament, including references to the principles of international humanitarian law (IHL), human rights, and the catastrophic humanitarian consequences of the use of nuclear weapons. All these factors, according to the authors, are a moral, political and legal imperative that necessitates the prohibition of nuclear weapons.

"1. Each State Party undertakes never under any circumstances to:
(a) Develop, test, produce, manufacture, otherwise acquire, possess or stockpile nuclear weapons or other nuclear explosive devices;
(b) Transfer to any recipient whatsoever nuclear weapons or other nuclear explosive devices or control over such weapons or explosive devices directly or indirectly;
(c) Receive the transfer of or control over nuclear weapons or other nuclear explosive devices directly or indirectly;
(d) Use or threaten to use nuclear weapons or other nuclear explosive devices;
(e) Assist, encourage or induce, in any way, anyone to engage in any activity prohibited to a State Party under this Treaty;
(f) Seek or receive any assistance, in any way, from anyone to engage in any activity prohibited to a State Party under this Treaty;
(g) Allow any stationing, installation or deployment of any nuclear weapons or other nuclear explosive devices in its territory or at any place under its jurisdiction or control".

Article I of the TPNW
2017
Source: https://disarmament.unoda.org/wmd/nuclear/tpnw/

A number of provisions of the Treaty appear to be contrary to the NPT and its provisions. In general, nuclear disarmament can hardly be considered in isolation from the overall strategic context. It is necessary to take into account the factors influencing strategic stability and international security such as unrestricted deployment of the global missile defense system, the development of strategic offensive arms in non-nuclear equipment, the continuing threat of the deployment of weapons in outer space, the objective weakening of the CTBT for a number of reasons, quantitative and qualitative imbalances in conventional weapons.

With all due respect to the concerns of a number of countries and non-governmental organizations (NGOs) regarding the nuclear threat, in expert terms, it is impossible not to note the contradictory role of the TPNW: the new treaty is fraught with a further increase in alienation between nuclear-weapon and non-nuclear-weapon powers. This could ultimately lead to the undermining of the foundations of the NPT and the destruction of the regime of this fundamental document. The text of the TPNW is inconsistent with the provisions of the NPT, according to which the complete destruction of nuclear weapons stockpiles must take place in accordance with a treaty on general and complete disarmament. In the work to promote the TPNW, a fundamentally alarming moment is the transformation of the provisions contained in this Treaty into customary law or the emergence of some *general practice* recognized as a legal norm as well as attempts to use the TPNW to involve the IAEA in the process of nuclear disarmament.

The Russian approach

At official venues, Russian representatives emphasize that the further process of nuclear disarmament should be carried out in strict compliance with Article VI of the NPT in the context of progress towards general and complete disarmament. At the same time, the only realistic option is a balanced step-by-step approach, which involves the gradual

creation of appropriate conditions that will make it possible to move forward on the path of nuclear disarmament in such a way that the relevant steps contribute to strengthening international stability and security and are based on the principle of enhancing the level of security for all. That is the approach that has been developed by consensus in the NPT review process.

Against the backdrop of the increasingly active actions of non-nuclear-weapon countries, cooperation within the framework of the Nuclear Five remained largely limited, which did not allow for the full use of the potential of this format in the interests of building a common line regarding efforts to accelerate progress towards *nuclear zero*. The contradictions are focused on the issues of regional security and verification.

VERIFICATION OF NUCLEAR DISARMAMENT: ASSESSMENTS AND FORECASTS

In recent years, numerous attempts have been observed at the multilateral level to outline or even to develop certain mechanisms for verifying the process of nuclear disarmament, which, according to the initiators of such efforts, are intended to be used on a multilateral basis and to serve as an independent impetus to move towards *nuclear zero*.

The first efforts in this direction were made by the First Special Session of the UN General Assembly on Disarmament back in 1978 and continued by the UN Disarmament Commission, an advisory body that is part of the UN *disarmament triad*. In 1988, the Commission identified 16 principles of verification, which are considered by proponents of nuclear disarmament as the basis for verification procedures in moving towards a world without nuclear weapons.

In a sense, the Group of Governmental Experts (GGE) established by 2018 UN General Assembly Resolution № 71/67 tried to summarize the efforts to work out specific verification procedures within the framework of bilateral or multilateral agreements, either directly (2010 New START between the United States and the Russian Federation) or indirectly (1996 CTBT), related to the process of disarmament in the nuclear field, and to create various specialized working bodies and structures.

Proponents of rapid bans on nuclear weapons have stepped up criticism of nuclear powers for their efforts to modernize nuclear weapons, which are seen as building up total strike capabilities leading to an arms race. Transparency and verification of nuclear disarmament have become common topics for both *moderate* and anti-nuclear states.

In this regard, certain hopes were pinned on the GGE, established in 2018 in accordance with UN General Assembly Resolution № 71/67 to consider the role of verification in promoting nuclear disarmament. The mandate of the Group was to discuss the role of verification in advancing the process of nuclear disarmament. In accordance with the mandate, the Group held three sessions in the period 2018-2019. However, it is evident from various sources that the outcome of the Group's work reflected a wide range of views, which in fact did not allow for the formation of a common understanding of the role and importance of verification mechanisms in the process of nuclear disarmament.

At the same time, Russia has ceased cooperation with the International Partnership for Nuclear Disarmament Verification (IPNDV) launched by the US and Norway. The decision to dissociate itself from the *partnership* was due to the plans of its participants to move on to the

development of practical tasks fraught with significant proliferation risks as well as due to the impossibility of advancing Russian approaches in the *partnership*. The Chinese followed suit.

Specific efforts to address nuclear verification issues have been made and continue to be made within the framework of a number of other international formats. Among them are: the above mentioned initiative of the United States and Norway IPNDV, the Nuclear Threat Initiative (NTI), the Information Center for Verification Research and Training (VERTIC). They are also summarized in the reports of the UN Secretary General. The activities of a special instrument of the UN Security Council (UN SC), the UN Commission on Monitoring, Verification and Inspection, which has even developed a system of sanctions in case of non-compliance with legally binding agreements, stand out. Summing up these efforts, one can single out the following principles of verification procedures in the nuclear field, which verification activities in this extremely sensitive area define as a basic.

▶ *Verifiability*

The first principle, according to the proponents of nuclear verification, is the very ability to carry out credible verification of nuclear disarmament, i.e., its *verifiability*. As experts of the United Nations Institute for Disarmament Research (UNIDIR) emphasize, verifiability is understood as the possibility of timely detection of significant violations of the agreements reached which makes it possible to take adequate response measures to neutralize the possible advantages received by the violator. UNIDIR estimates that such a scheme could also be used for the verification process of nuclear disarmament.

▶ *Transparency*

The second principle, according to the proponents of the idea of verification, is *transparency*. At the same time, they actively refer to the Plan of Action on Nuclear Disarmament adopted by the 2010 NPT Review Conference. In general, most advocates of resolute and unconditional nuclear disarmament recognize that without an institutional framework for transparency and without specific verification procedures, it will be impossible to achieve the verifiable and irreversible elimination of nuclear weapons. In this sense, the TPNW did not justify their hopes for detailed and legally binding schemes for verifying nuclear disarmament.

▶ *Irreversibility*

The third principle of nuclear disarmament activists is *irreversibility*. They refer to the fundamental documents adopted within the framework of the NPT review process. In particular, the final document adopted by the 2000 NPT Review Conference, containing 13 practical steps in the field of nuclear disarmament. In general, despite attempts to institutionalize the principle of irreversibility, many documents, such as the final document of the 2010 NPT Review Conference, have failed to achieve a universally understood definition of what irreversibility is. Some experts disagree on the practical feasibility of the principle of irreversibility, since almost all steps in the field of nuclear disarmament turn out to be quite reversible. It is recognized that it is impracticable to comply with safeguards for the irreversible dismantling of a nuclear warhead, and that it is also impracticable to comply with the principle of irreversibility with regard to the resulting fissile material, so that it is not re-used for its military purpose.

▶ *Effectiveness*

The fourth principle is *effectiveness*, which is recognized by the majority of experts. There are quite a lot of definitions of *effectiveness*, but its variants can be reduced to a rather simple formula – *the effectiveness of verification is a state when one party to an agreement has adequate confidence in its implementation by the other party (parties)*. In other words, without reference to a specific *contractual context*, all conversations about verification will be meaningless.

Additional arguments in favor of this approach were provided by the process of preparation and opening for signature of the TPNW. The dominant line in the approaches of non-nuclear-weapon states (with the exception of NATO members covered by the US nuclear umbrella) was the idea that they are doing much more for nuclear disarmament, primarily by creating a proper political environment, than the nuclear-weapon states. The nuclear-weapon states, on the other hand, were required to establish specific *frontiers* in the movement towards *nuclear zero*. Thus, radically moved countries are gradually beginning to develop the idea that the existing *asymmetry* between nuclear-weapon and non-nuclear-weapon states with regard to the obligations arising from the IAEA Comprehensive Safeguards Agreement and its Additional Protocol should be gradually but steadily eliminated. The idea of anti-nuclear states is the gradual but steady placement of nuclear-weapon states under the IAEA safeguards as they eliminate nuclear weapons. According to them, this will be a concrete contribution to the observance of the principle of non-discrimination.

Another aspect of the verification problem is compliance with the principle of nonproliferation, which is ensured by controlled access to sensitive information. The importance of restricted access was emphasized during the meetings of the three working groups within the framework of the IPNDV initiated by the United States and Norway and in its relevant final documents. However, during the meetings of the working groups of the IPNDV, no practical guarantees or even recommendations were given on how to really achieve *limited access* and how to ensure the non-dissemination of sensitive information.

CONCLUSIONS AND FINDINGS

First of all, it should be noted that in the process of promoting the policy of pushing the process of nuclear disarmament through the creation of ready-made verification procedures, strategic factors that could lead to the creation of the conditions necessary for launching the process of multilateral nuclear disarmament are diligently avoided. Non-nuclear-weapon states and radically moved NGOs may have false expectations about the ease and feasibility of such procedures, regardless of the strategic context and regardless of the willingness of the *de facto* nuclear-weapon states themselves.

By emphasizing the humanitarian imperative of nuclear disarmament, the creators and supporters of the TPNW actually pulled the topic out of its strategic context. In fact, the policy has been taken to divert the attention of the international community to the need for immediate bans in the nuclear sphere from the really urgent tasks and problems of international security. The condition for a possible sustainable and irreversible move towards *nuclear zero* is not the existence of well-written and well-developed verification procedures, but a combination of very specific strategic factors. ■

PAPER 17.

DO WE REALLY FEAR NUCLEAR WEAPONS?

Dmitry Trenin

Do we really fear nuclear weapons? This question is certainly very good and poignant. However, it begs another question: "*Who is this we*?".

If *we* means Russian people, the answer is probably *yes*. For four decades of the Cold War, which followed, almost without interruption, World War II (1939-1945) (WWII), known in Russia as the Great Patriotic War (1941-1945) that left more than 27 million of Soviet people killed, the most frequently expressed popular wishes were: "May there be no war… Let the skies over our heads be clear", and the famous *Miru-Mir* (*Peace to the World*). The closest the Soviet Union and the United States came to a *nuclear catastrophe* was in 1962, during the Cuban Missile Crisis – or as the Russians call it the *Caribbean Crisis*. Two decades later, in 1983, there was another nuclear war scare because of the Euro-missile crisis and of the general fast deterioration of relations between Moscow and Washington.

The USSR's biggest military engagement of the post-WWII period was the war in Afghanistan (1979-1989) which killed just over 15.000 Soviet soldiers. There was no chance, however, of that war going nuclear. The situation in Chechnya in the 1990s and the early 2000s, was a much bigger calamity, but that was a domestic conflict within the Russian Federation. Since February 2022, when the Special Military Operation in Ukraine started, Russians realize that their country has been at war, this time very close to Moscow itself, and against a very powerful Western coalition led by the United States. Although Russia's battlefield enemy has been the Ukrainian Armed Forces, in reality Ukraine is only the tip of the spear used by the United States to inflict a strategic defeat on Russia. In a proxy war between the two nuclear superpowers fought with the most decisive goals in a region of vital strategic importance to one of them (think Cuba 1962), the danger of the war escalating, all the way to the nuclear level, is very real. Thus, the fear of a nuclear war is real among Russians.

If *we*, however, means the people of North America and Europe, the answer is probably *not enough*. Europeans and Americans are aware, of course, of the existence of nuclear weapons, and know that nuclear weapons might indeed be used. But they believe that the war will continue to be fought *over there*, on Europe's fringes in Ukraine, or (for Americans) in Europe, and that they themselves are unlikely to be affected by it directly.

So, the reality is that we have a major power conflict going on in its third year, right now. A conflict between two nuclear superpowers: America vs Russia. True, it is a proxy war. For now. But it can escalate. For example, if the F-16 aircraft that Ukraine's Air Force have been promised to be provided are based in neighboring NATO countries Russia can

strike at those airfields. Or if the long-range missiles that the United States and Germany may give Ukraine strike deep in Russia's rear, Moscow can retaliate against the countries that provided those weapons system to Kiev. Such developments can lead to a head-on collision between Russia and the West, which at some point is very likely to turn nuclear.

> "I am going back to the idea of fear, because nothing else can hold back our opponent, seriously. I believe that the US strategy of inflicting strategic defeat on Russia is based on the belief that Russia will not use nuclear weapons: either it will fear or believe that the destruction of civilization is still too great a price to pay for maintaining its positions. And here, in my view, lies a potentially fatal miscalculation for all mankind, because I always remember when Vladimir Putin said in 2018: "There is no need for a world without Russia". And I remember this thesis all the time. But I do not think it is taken that seriously by many people in the United States, for example… the territory of the Russian Federation has long been under attack. Yes, by Ukrainian strikes, but on behalf of Americans and NATO, with weapons provided by the United States and some NATO member states… In my opinion, many people in the United States and Europe (in Europe – to a much lesser extent) probably consider the exchange of nuclear strikes on the European theater of war, that is, not only Ukraine, but wider, as something not so catastrophic. And the main thing here, as I see, is to turn nuclear weapons into an effective element of deterrence in the Ukrainian conflict, in order to convince the United States that an attack will follow on the territory of the United States as well".
>
> **Dmitry Trenin in an interview for the telecast «International Review»**
> **Russia 24 Channel**
> **(Unofficial translation)**
>
> **May 5, 2022**
> *Source: https://globalaffairs.ru/articles/vernite-strah/*

One reason for being where we are now is the dissipating fear of a nuclear war. Western leaders have been bold, or, to put it less charitably, reckless, in pushing their military alliance, NATO, closer and closer to Russia's borders over the past 25 years. As for the Western publics, which were very sensitive to the danger of a nuclear war 60, 50 or 40 years ago, they are currently in a *de facto* denial of such a threat to them. There are reasons for that.

PAST PERIOD OF NUCLEAR STALEMATE, ITS AMBIGUITY AND EROSION

Historically, fears of a nuclear war were based on real experience of the US atomic attacks against the Japanese cities of Hiroshima and Nagasaki in August 1945. So, the atomic bomb was not just an abstract threat. It was a real, usable weapon that immediately killed hundreds of thousands of civilians and let many thousands more die over the years of the consequences of its deployment.

Moreover, the US nuclear strikes against Japan in the final days of the Pacific War were in fact the opening salvos in the Cold War that was beginning between the United States and the Soviet Union. For several years, while America enjoyed its nuclear monopoly, the US strategists were devising plans for dropping atomic weapons on Soviet cities to knock out a rising global rival.

Consequences of the US atomic attacks against the Japanese cities of Hiroshima and Nagasaki in August 1945

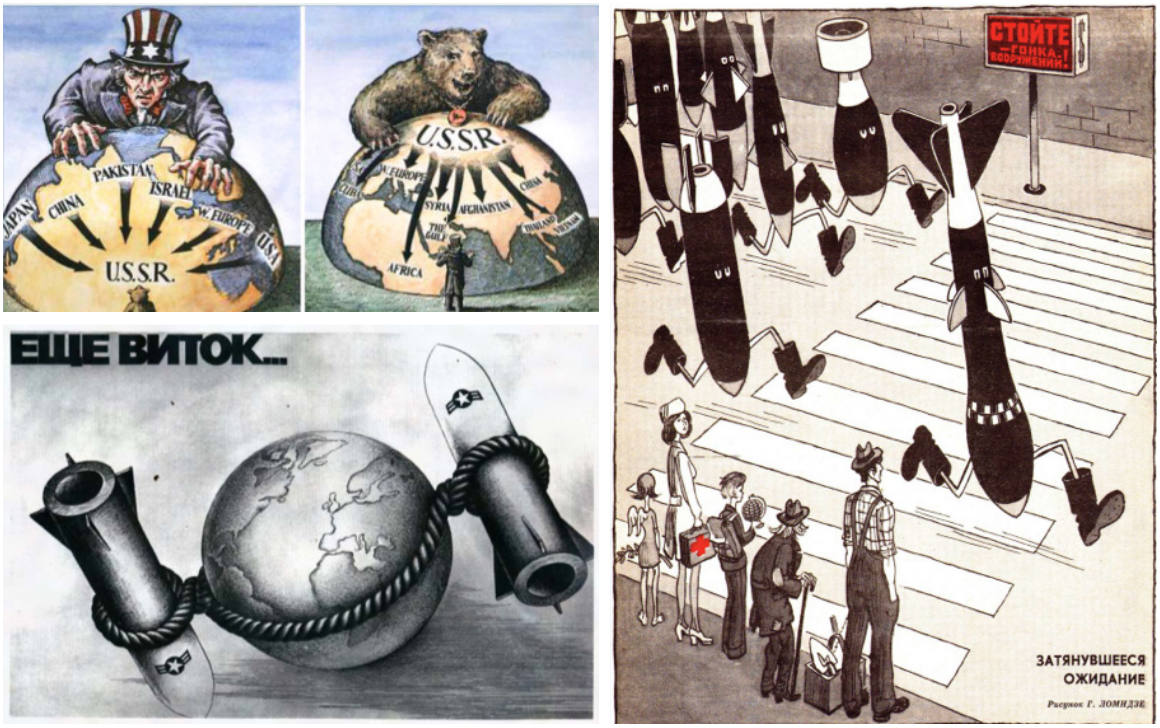
Source: open data

These plans had to be modified when the Soviet Union developed its own atomic, and later hydrogen bombs, and, by launching the world's first Earth satellite *Sputnik* let it be known that it had intercontinental ballistic missiles that could reach the territory of the United States of America. The result was a *nuclear stalemate* between the two superpowers, based on the reality of a mutual assured destruction (MAD) in case of a war between them. Actually it was widely believed, *any* war between them.

In this fashion, nuclear deterrence reigned supreme for four decades. Not only did it forbid a nuclear exchange and the resultant mutual annihilation; it made what was known in the United States as a *central conflict* between the America and the Soviet Russia in Europe impossible. During the Cold War, *proxy wars* were waged far away from the *central front*: on Korean Peninsula, Vietnam, Africa, the Middle East, Afghanistan, where the results were only of peripheral importance to the main competition. There was only one geopolitical incident that could have led to a nuclear war, particularly 1962 Cuban Missile Crisis. Then, the Soviet leader Nikita Khrushchev (1953-1964) challenged the United States by deploying nuclear missiles just 90 miles off the coast of Florida. It was in the fall of that year that fears of the imminent end of the world reached sky-high and would be remembered long after that.

A decade of the US-Soviet *détente* in the 1970s that aimed at creating strategic stability in the relationship between the adversaries quelled fears of a nuclear war, but the demise of *détente* and the Euro-missile crisis – the deployment of the US Pershing-II and intermedi-

ate-range cruise missiles in Western Europe with a short flight time to Moscow to counter the modernization of Soviet missiles that targeted NATO countries – brought them back. Arguably, 1983 was the most dangerous year in the history of the Cold War since 1962.



Some cartoons portraying Cold War

Source: open data

However, these new fears were short-lived. With Mikhail Gorbachev (1985-1991) in the Kremlin pursuing *Perestroika* and *Glasnost*, Moscow's foreign policy made a sharp turn. Towards the end of the Cold War, which at that time was widely celebrated as a joint achievement and a common victory for both sides, Soviet and American leaders agreed on drastic reductions of their nuclear arsenals and famously stated, in 1990, that *a nuclear war cannot be won and must never be fought*[75].

Europeans, who during the Cold War lived uneasily on the East-West frontline – or, to put it differently, sat on a potential nuclear battlefield, were only too happy to bury their fears of nuclear war amid the rubble of the Berlin Wall in 1990 and clear them away. Americans were relieved of the burden of confrontation with a mighty adversary and were looking forward to *enjoying* the peace dividend.

The Cold War ended over three decades – a generation and a half – ago. It is *ancient history* to a lot of young people. Politicians in Europe do not deal with matters of war and peace any longer. Politicians and military leaders in the US have become experts in waging small wars in distant places with minimal casualties for their own side. Sheer survival is no longer the main concern of either elites or the wider publics. Instead, to quote Bill Clinton's 1992 presidential campaign remark: "It is the economy, stupid!".

[75] For the very first time this tenet was proclaimed by President Ronald Reagan and General Secretary of the Communist Party of the Soviet Union Mikhail Gorbachev at their summit in Geneva in 1985. It was reiterated in January 2022 by the leaders of China, France, Russia, the UK and the US. – Editor's Note.

In the ensuing decades, the political agenda across the West has changed dramatically to focus on issues such as climate change, public health, biotech, and artificial intelligence. The quality of leadership has sunk no less dramatically. Statesmen are in very short supply. Those with any knowledge, not to speak of experience with, dealing with nuclear-related – or simply major strategic – issues are extremely few and very far between. But this has not been considered a problem, for total superiority of the West over the rest made fear inappropriate.

Americans, who claimed victory over Soviet Russia in the Cold War, celebrated their rise to the position of the greatest power in the history of the world. The entire world, for the first time ever, became dominated by a single country – an indispensable nation sitting at the pinnacle of the unipolar system that it commanded. It really had nothing to fear, certainly not from any rival power. Its unprecedented hegemony was unchallenged.

> "At the same time, the system of global institutions is not the same as the world order. Shortly after the end of World War II, the confrontation of the two ideological and military-political poles, in particularly, the United States and the USSR, started. This order was maintained by their mutual nuclear deterrence in a politically and ideologically divided world. As a result of the efforts or with the help of the Soviet Union, in the countries of Eastern Europe, China and several other states, Communists parties came to power, and the global socialist system emerged. In the rest of the world, where the sole political, ideological, military and economic leadership of the United States was established, market relations were being developed, military alliances were being created, norms and rules were being worked out under the leadership of the Americans. Thus, in the context of the Cold War, US-centered system was formed, covering most of the world. At the same time, the United Nations was preserved, but not as a real instrument of global governance, but as a platform for public controversy and not always public contacts between the two camps. Other global or regional (in Europe, for example) international organizations functioned mainly on a parity basis. International law continued to be based on the principle of state sovereignty and represented the complex of agreements from which each of the high contracting parties could withdraw at any time. With the end of the Cold War, the collapse of the USSR, the collapse of the world socialist system and China's transition to a policy of reform and openness, the sole leadership of the United States became global for the first time in human history. Pax Americana system, which covered the Western states and the developing countries for the previous 45 years, has become worldwide. The countries of Eastern Europe integrated into it, Russia actively tried to become a part of the West, China became a factory of the world that attracted so many Western, especially American investments. The US hegemony during this period (from the beginning of 1990s to 2010s) was undeniable. Firstly, China was focused on internal development. Secondly, Russia sought to get a foot in the Western door. Thirdly, the entire world has become unipolar in all respects, in particularly economically, politically, militarily, ideologically".
>
> **Dmitry Trenin in an interview for PIR Center**
> *Source: https://pircenter.org/wp-content/uploads/2023/05/SI-INT-2-36-Trenin.pdf*

The problem for the power on top was, as always, creating a new order after a world war. And the Cold War was an equivalent of a world war.

The United States has singularly failed in that task. The country which America thought it had defeated – Russia – was not integrated into the new system on the terms minimally acceptable to it. During the Cold War, the United States, while treating the communist system with contempt, had to respect Soviet power as a co-equal. That respect was certainly based on fear. With fear gone, so was the respect.

The theme in the United States then was, that history, including the history of power balancing, was over. But of course, it was not. History is rich in experience on that score. It suggests that failure of integrating a powerful former adversary while ignoring its security interests was a recipe for disaster.

WHEN DETERRENCE WAS STRENGTHENED, WHEN DETERRENCE FAILED

This is not the place to discuss the origins of the Ukraine war. It is important to note, however, that the war in Ukraine is not similar to the conflicts in Vietnam (1955-1975) or Afghanistan (1979-1989) during the Cold War. Ukraine is more like Cuba in 1962.

Then, Soviet leader Nikita Khrushchev tried to balance American missile bases in Turkey and Italy with a Soviet base in Cuba. When it learned about it, the John Kennedy (1961-1963) administration in Washington was considering the use of force to prevent Cuba from becoming a Soviet missile base. A nuclear war between the US and the Soviet Union appeared imminent. In the end, common sense prevailed. Deterrence was strengthened.

Ukraine, from 2014 through 2022, signaled a failure of deterrence. Since the Washington-supported Maidan coup in Kiev, the United States has been essentially building an unsinkable aircraft carrier parked not only right on the Russian border, bur virtually on the doorstep of Moscow itself. Russian protests against that were ignored as irrelevant, even absurd. When Russian President Vladimir Putin concluded that time was not working for Russia, and a fight was inevitable, he decided to launch a Special Military Operation in Ukraine.

Russian warnings against Western intervention in the armed conflict in Ukraine were dismissed by the United States as bluffing. Indeed, Moscow did not respond to several rounds of escalation of that intervention. Emboldened, the United States set the objective that it had carefully avoided during much of the Cold War: inflicting strategic defeat on the other nuclear superpower in a strategically important region.

Several months after the start of the Special Military Operation in Ukraine, escalation has gone a long way. Each time when the United States raised the stakes, it did so carefully, seeking to avoid provoking a Russian reaction that would expand the geography of the conflict. Yet, even as Washington succeeded in giving Ukraine more capable weapons systems and assisting it in a range of other ways, it became progressively more involved in the war.

The Biden administration (2021-present) is betting that by following the strategy of defeating, and later diminishing Russian power by using Ukraine as its proxy it will be able to *win* the war against Russia. It is not a safe bet. For Russia, the war in Ukraine is not a war of conquest or an attack on a neighboring democracy. It is a battle to protect vital national security interests that Moscow believe would be jeopardized by Ukraine's NATO membership and by the US military bases in its territory; it is a pushback against pretensions against those interests of yet another hegemonic power akin to Napoleonic France or

Hitler's Germany; and it is a part of a fundamental domestic transformation. Washington's assumption that Moscow will play by the US rules is fatally flawed. Washington is playing the *Russian roulette* with a *nuclear bullet* in the revolver.

HOW TO RESTORE FEAR AND PREVENT MUTUAL ASSURED DESTRUCTION?

There are different scenarios for how the situation may escalate – both horizontally, beyond the current battlefield, and vertically, all the way to the level of a strategic nuclear exchange. None of them is good. The absence of fear on the Western side makes them more likely.

But what needs to be done to prevent MAD? Above all, strengthening deterrence is an answer.

What this entails includes:

- to expand the range of conditions for using nuclear weapons in other words, to lower the currently too high nuclear threshold;
- to hold exercises to train the military in deploying nuclear weapons in accordance with the modified conditions for nuclear use;
- to develop and to practice a signaling system – by actions rather than words - to warn the enemy that it is coming too close to that threshold;
- to engage in demonstration activities (to resume nuclear testing, to send out strategic air patrols close to the enemy's shores and borders, etc.);
- to carry out a nuclear air burst as a warning shot.

Essentially, strengthened deterrence should prevent any war between nuclear powers, whether conventional or nuclear; kinetic or by proxy.

One needs to bear in mind, however, that, in order to be effective, deterrence needs the fear factor. Without it, it will not work. The loss of fear is not only critical; it can be fatal.

CONCLUSION

As long as nuclear weapons exist, they ought to inspire fear. This is what they are for – prevention. To be able to perform that function, they need to be considered absolutely usable. The fear, in other words, should be real.

Winston Churchill put it in the 20th century: "Peace is the sturdy child of terror".
It remains so in the 21st.

Bring back the fear: *we all* need it; and this is nothing to be ashamed of. Learn to respect one's enemies and adversaries, as indeed all others. And build all sorts of equilibria as a basis for security.

And – Good luck with all of that.

UNIT IV.

PEACEFUL USES OF NUCLEAR ENERGY AS THE THIRD PILLAR OF THE NPT

PAPER 18.

NUCLEAR ENERGY IN THE GLOBAL ENERGY BALANCE AND INTERNATIONAL NUCLEAR LAW

Mikhail Lysenko

Nuclear energy means energy produced in the core of atoms which are tiny particles that compose every matter in the universe. When atoms undergo internal transformations, they discharge enormous amounts of energy and heat.

In nuclear fission reaction atoms split and release energy. This reaction is used in a controlled manner at nuclear power plants (NPP). The core of those plants are nuclear reactors where the splitting of atoms generates energy. That energy heats the surrounding water emitting steam which drives turbines to produce electricity.

In nuclear fusion reaction atoms combine to form a larger atom thus also releasing energy (thermonuclear energy). Such reactions take place naturally in the sun. Scientists have managed to produce fusion energy but have been not able yet to contain it for at least several seconds because of the extra heat released during nuclear reactions. If and when such experiments succeed in containing the thermonuclear energy in a controlled matter, it might provide us with cheap and almost endless sources of energy.

Nuclear technologies have occupied their place in all spheres of our daily life:

- health: X-ray checks, radiology tests or treatments;
- agriculture: insect control, reduction of plant diseases, food irradiation;
- industry: radioisotopes to monitor fluid flows and filtrations, to detect leaks, to estimate engine's wear and corrosion;
- outer space: nuclear fueled engines for outer space vehicles and distant space missions, etc.

ON THE TERMINOLOGY: ATOMIC VS NUCLEAR

As it is seen in the subject the energy is produced during transformation of atoms. That is why the term *atomic energy* is relevant. It was dominantly used in official language especially in the 1950s and 1960s (*Atoms for Peace* speech, International *Atomic* Energy Agency (IAEA), etc.).

At the same time, to be more precise, it is the energy produced in a process of transformations with atomic nucleus. Therefore, the term *nuclear energy* is also relevant. In our days, linguistically, the word *nuclear* became a pattern in official documents. All multilateral treaties are those on cooperation in nuclear-related matters: *nuclear* safety, *nuclear* security, *nuclear* accidents, *nuclear* fuel, *nuclear* liability, etc.

To conclude: in a legal sense both definitions (atomic and nuclear) are appropriate, there is no legal difference between them but currently the term *nuclear* is the dominant one.

GLOBAL ENERGY FORECASTS

Forecasts of the global energy market until 2050 assert that global demand, consumption and production of electricity will permanently grow. It is expected that the global energy balance will change. Today it is dominated by oil, coal and gas. In the nearest future shares of coal and oil will decrease, while those of gas and alternative sources increase. It reflects the growing trend towards mitigation of negative effects of climate change. For that reason, many countries adopted national strategies to achieve carbon neutrality. They wish to build so-called *green economy*.

> ***"Until 2050 the demand for natural gas will increase in all regions of the world except North America and Europe. Europe's share will drop by more than half – to 5 percent. But the share of Asia, on the contrary, will increase by one and a half times – from 21 percent to 30 percent".***
>
> **Russian President Vladimir Putin**
> **RIA Novosti**
> **2023**
> **(Unofficial translation)**
> *Source: https://ria.ru/20231011/gaz-1902040325.html*

According to the UN Secretary General António Guterres, more than 110 countries have expressed their commitment to achieving carbon neutrality by 2050[76]. China has committed to do this by 2060. The Russian President also stated that Russia's goal to achieve carbon neutrality by 2060 was an absolutely realistic plan[77].

Today	By 2050
Energy consumption is growing by 2%	Energy consumption growing by 1-1,5%
Hydrocarbons (oil, gas, coal) = 75%	Hydrocarbons (oil, gas, coal) = 40-50%
Alternative, nuclear, hydro, others = 25%	Alternative, nuclear, hydro, others = 50-60%

NUCLEAR ENERGY IN THE GLOBAL ENERGY BALANCE

The global energy balance is very unstable. It is highly dependent on a variety of factors. Alternative sources, primarily wind and solar, with all their merits, occupy huge areas, de-

[76] Secretary-General's address at Columbia University: "The State of the Planet" // United Nations, December 2, 2020.
[77] Путин подтвердил план достичь углеродной нейтральности экономики РФ до 2060 года // Известия, 22 августа 2023 г.

pend critically on weather conditions, are not powerful enough to feed up heavy industry. There are no ecologically-free ways to utilize the outdated blades and solar panels. Wind and solar sources are not enough and are not reliable to provide non-interrupted electricity to, say, aluminum, iron, steel industries or machine-building plants.

One should also remember the big blows at the European energy market as a result of strategic economic miscalculations by the European Union bureaucrats in their long-term energy policy. They were even more aggravated by the current international turbulence, waves of endless sanctions, and the breakdown of the world logistical system. It led to sharp rises in prices for oil and gas, interruptions in the supply of hydrocarbons. Some European countries began to re-activate coal production and demand limitations on energy consumption.

Power plants burning coal and oil are rather cheap but produce lots of carbons and are dependent on constant fuel supplies. Hydroelectric power plants have a number of advantages. They do not produce greenhouse gases. But large hydroelectric dams lead either to flooding of surrounding areas or to serious landscape environmental changes. Gas electric power stations are capable to provide electricity to large production facilities. They pollute the atmosphere much less compared to oil and coal.

It is no coincidence that the European Union equated gas with clean energy sources. However, gas power stations require a continuous supply of gas in large quantities. Against this background, it is the nuclear energy which has a good chance to preserve or increase its share in the world energy market.

> ***“But nuclear energy is not only a way to make the shift to low-carbon energy production, it provides enhanced security of supply. That has become a bigger factor as the world faces the most serious energy crisis since the 1970s… it was becoming absolutely clear the transition to green energy would be very disruptive without the reliability of nuclear power. Nuclear power provides a baseload of energy to solar and wind when the sun doesn’t shine and the wind doesn’t blow”.***
>
> **Director General of the IAEA Rafael Grossi**
> *Source: https://www.iaea.org/newscenter/statements/lecture-by-the-director-general-at-the-coral-bell-school-of-asia-pacific-affairs-anu-college-of-asia-the-pacific*

Today there are about 440 nuclear power reactors operating in 32 countries plus Taiwan[78], with a combined capacity of about 390 GW(e). In 2022 they provided 2545 TWh, – about 10 percent of the world’s electricity. About 30 countries are considering, planning or starting nuclear power programs. About 60 power reactors are currently being constructed in 16 countries.

World Nuclear Association
Source: https://world-nuclear.org/information-library/current-and-future-generation/plans-for-new-reactors-worldwide.aspx

[78] Indicating Taiwan separately in this Paper does not imply recognition of its independent status. We consider Taiwan as a part of the People’s Republic of China. – Editor’s Note.

As a carbon-free energy source, nuclear energy can play a significant role in the transition to a green economy. Nuclear energy produces about a quarter of all clean energy in the world. It is expected that nuclear energy will at least retain its share (10 percent) and its position in the global energy balance. As a credible scenario, global nuclear power generation capacity could double by 2050.

BENEFITS OF NUCLEAR ENERGY

Nuclear energy has the following inherent benefits. It is:

- *Reliabile*. Nuclear power is a constant, uninterrupted, controllable, predictable source of energy that does not depend on weather and climate changes. It can operate at full capacity without interruption (except for reloading) for dozens of years. This is its difference from renewable energy sources with variable generation: solar and wind power plants require backup energy sources that are connected during interruptions in power output when the sun sets or there is no wind.

- *Environmentally friendly*. There are no emissions of carbon monoxide, greenhouse gases and harmful substances. According to the IAEA nuclear power has avoided more than 60 giga tons of carbon dioxide emissions over the last 50 years.

- *Cost-effective*. NPPs do not require huge volumes of constantly supplied fuel. 0.5 kg of uranium fuel equals about 60 tons of oil fuel (one railroad or oil tank). One nuclear reactor needs only 2-3 tons of nuclear fuel for its operation for several years.

- *Reusable*. Fissile material (uranium-235) does not *burn up* completely in a nuclear reactor and the spent fuel can be used again after regeneration (unlike fossil fuel ashes). In the future, a complete transition to a closed fuel cycle with complete combustion of waste is possible.

- *High-tech and socially oriented*. Nuclear industry contributes to scientific research, personnel training, and export of high-tech products. One working place in the nuclear industry creates ten workplaces in related industries.

- *Predictable and long-term*. Life cycle of a NPP from its design to decommissioning is about 100 years.

COMPLEXITIES OF NUCLEAR INDUSTRIES

However, nuclear industries have many technological, industrial and logistical complexities. Creation of a national full-fledged nuclear industry requires a full nuclear cycle. It includes:

- uranium mining and processing of the raw material into a concentrate (*yellow-cake*);
- purification from impurities and mixing with fluorine;
- enrichment in centrifuges;
- transformation from a gaseous state into metal powder;
- *baking* of fuel pellets from metal powder;
- installation of pellets into zirconium rods, and the rods into assemblies;

- installation of assemblies into reactors;
- construction and operation of nuclear power plants, connections to electric networks, etc.;
- handling of spent fuel and radioactive waste;
- decommissioning of nuclear power plants and rehabilitation of territories.

It is clear that only a narrow group of countries can afford such large-scale and expensive facilities and infrastructure. However, all the countries can have access to atomic benefits through international cooperation and the IAEA assistance programs.

Full nuclear cycle	Partial nuclear cycle
1) Russia	1) China
2) USA	2) DPRK
	3) France
	4) Great Britain
	5) India
	6) Pakistan
	7) Republic of Korea

NUCLEAR RISKS AND CHALLENGES

"I do not exclude that the US and Western countries are tempted to have Ukraine acquire nuclear weapons, or the capability to manufacture them, or some kind of dirty nuclear bomb and radiological weapons. For what? Firstly, to blackmail Russia. Secondly, to provoke Russia's use of tactical nuclear weapons, that is, for having a limited nuclear conflict on the territory of Ukraine. Again, for what? To make Russia to be a pariah-state – to accuse of violating international law, to create some kind of tribunal and just to tell everyone: «Just look what those Russians are doing!». But I think that the Americans are aware of all the risks of such circumstances and are themselves full of fears. Let's imagine that Ukraine has nuclear weapons – its own or American ones – what's then? No one will give a guarantee that the Russian army would not seize these nuclear devices. Such a scenario clearly would not suit the US. Or another scenario is that Ukraine would start blackmailing its neighbors, for example, Poland, and the US, requesting to give Kiev more money. This regime in Ukraine is completely unpredictable".

Mikhail Lysenko in an interview for PIR Center
2023
(In Russian)
Source: https://pircenter.org/news/da-nado-priznat-chto-krizis-realen-situacija-v-oblasti-neraspros-tranenija-uhudshaetsja-no-vse-jeto-ne-fatalno-intervju-s-m-n-lysenko/

Anyway, the use of nuclear power is associated with specific risks for humans and environment. As the Chernobyl and Fukushima NPPs accidents in 1986 and 2011 have proved, if NPP operated improperly (human errors in Chernobyl and faulty engineering at Fukushima), it can result in huge regional accidents with transboundary radiological contamination and evacuations of local populations at huge territories.

There is a risk of unlawful outflow of nuclear materials and technologies. If terrorists or greedy smugglers gen them, they can construct a *dirty bomb* which could be used to terrorize civilians or to blackmail authorities. There is a possibility that such a weapon might be used in the current outburst of hostilities in the Middle East or Ukraine. For example, there is a real threat of a deliberate damage to or destruction of the nuclear facility to cause a nuclear catastrophe at the Zaporozhye Nuclear Power Plant (ZNPP) which has been constantly bombarded by the Ukrainian armed forces.

INTERNATIONAL LEGAL REGULATIONS FOR COOPERATION IN PEACEFUL USES OF NUCLEAR ENERGY

The safe and secure operation of nuclear infrastructures requires proper legal regulations and management, both at national and international levels. Accordingly, the main condition to start developing and operating any elements of a national nuclear industry is nuclear safety and nuclear security. It is also the basic principle for all rules of the international nuclear law.

Nuclear safety and nuclear security are a complex, comprehensive set of rules. It relates to all stages of the nuclear cycle. It includes:

- safety in uranium mining;
- nuclear safety which means safe technical operation of nuclear facilities;
- nuclear security which means measures of prevention, detection and response to acts of theft, sabotage, illegal transfer of nuclear materials or radioactive substances for any malicious acts including terrorism;
- safety and security of transportation of nuclear materials;
- rapid information exchange, collective response and assistance in case of nuclear accidents;
- nonproliferation of nuclear weapons as a special legal regime;
- broad international cooperation.

All these types of nuclear activity are supported by an extensive international treaty base which comprises sources of international nuclear law. They include international conventions on:

- nuclear safety;
- nuclear security and countering nuclear terrorism;
- nuclear nonproliferation;
- liability for nuclear damage;
- hundreds of bilateral intergovernmental agreements on cooperation in peaceful use of nuclear energy;
- Statute of the IAEA;
- customary law (IAEA recommendations which eventually become part of international treaties and national legislations).

Nuclear safety	Nuclear security
▶ 1994 Convention on Nuclear Safety (CNS) contains obligations to implement safety rules and standards at all civil facilities related to nuclear energy. These include regulations for site selection; design and construction; operation and safety verification; emergency preparedness. ▶ 1986 Convention on Early Notification of a Nuclear Accident provides for notifications of any nuclear accident that could affect other states. IAEA and the other states that could be affected should be immediately notified *(adopted as a direct response to Chernobyl nuclear accident in 1986).* ▶ 1986 Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency provides for any assistance that states can render in case of a nuclear accident that occurs in another state *(adopted as a direct response to Chernobyl nuclear accident in 1986).* ▶ 1997 Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management imposes preventative measures on handling of spent fuel and radioactive waste.	▶ 1979 Convention on the Physical Protection of Nuclear Material (CPPNM) provides for physical protection of nuclear material in international transportation. It also establishes a general framework for cooperation among states in the protection, recovery, and return of stolen nuclear material. In 2005, a Diplomatic Conference was convened to amend the 1979 Convention. The amended Convention got a new name as the Convention on the Physical Protection of Nuclear Material and Nuclear Facilities. It broadens the scope of the initial Convention to include physical protection requirements for nuclear facilities and nuclear material in domestic use, storage and transport. ▶ 2005 International Convention for the Suppression of Acts of Nuclear Terrorism is aimed at criminalizing acts of nuclear terrorism and at promoting police and judicial cooperation to prevent investigate and punish those acts. ▶ 2004 UN Security Council Resolution № 1540 establishes legally binding obligations on all UN member states to prevent terrorists and other non-state actors from obtaining weapons of mass destruction.

Civil liability for nuclear damage

There are three international conventions and their follow-up amendments governing issues of liability in cases of a nuclear accident:

- 1960 Paris Convention on Third Party Liability in the Field of Nuclear Energy;
- 1963 Vienna Convention on Civil Liability for Nuclear Damage;
- 1997 Protocol to Amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage;
- 1997 Convention on Supplementary Compensation for Nuclear Damage (CSC).

All three conventions share the same principles governing nuclear liability but differ in terms of implementation.

RUSSIA IN THE GLOBAL NUCLEAR MARKET

Russia is the undisputed leader in the global nuclear market. Russia is:

- № 1 in the number of NPPs under construction abroad (portfolio – 33 nuclear power plant unit projects in the pipeline in ten countries which corresponds 88 percent of the world nuclear export);
- № 1 in uranium enrichment (35 percent of the world market);
- № 1 as the owner and operator of the world's only fleet of nuclear-powered ice-breakers (8 vessels, several more under construction);
- № 3 in reserves and volume of uranium production (15 percent);
- № 3 in the nuclear fuel market (17 percent).

Nuclear energy provides 20 percent of electricity in Russia.

State Atomic Energy Corporation Rosatom (ROSATOM) is one of global technological leaders, with capacities in the nuclear sector and beyond, and business partners in 50 countries. As one of the pioneers of the nuclear industry, ROSATOM has traditionally been at the forefront of the international nuclear market, including nuclear power plant construction, uranium mining and enrichment, and nuclear fuel fabrication and supply. Today, thanks to the unique expertise accumulated over 75 years, the company is conquering the markets of new promising high-tech products. Hydrogen energy, energy storage, nuclear medicine, wind energy, composite materials, logistics business, environmental solutions.

The ROSATOM business strategy is guided by the international sustainable development agenda. ROSATOM makes a significant contribution to the achievement of the UN Sustainable Development Goals as a low-carbon electricity company, developing nuclear, hydrogen and wind energy. Annually, Russian-designed nuclear power plants prevent more than 210 million tons of greenhouse gas emissions, which is the main cause of climate change. Since October 2020, ROSATOM has been a member of the United Nations Global Compact Network, the largest corporate social responsibility and sustainable development initiative for businesses across the world.

Today Russia is leading in new nuclear construction abroad. ROSATOM holds first place in terms of the number of simultaneously implemented nuclear reactor construction projects (3 units in Russia and 33 abroad at various implementation stages).

Source: https://www.rosatom.ru/en/about-us/

Rosatom State Corporation which is a state corporation in charge of atomic energy combines 460 organizations and employs 360 thousand people. Russia has concluded more than 100 intergovernmental agreements on the peaceful use of nuclear energy with about 90 foreign countries, as well as with the IAEA and other international organizations. In recent years, nuclear power plant units have been completed by Russia in China, Belarus, India, and Iran. At the advanced stage of construction are nuclear power plants in Bangladesh, Egypt, Türkiye, as well as new units in China, Hungary, India. More than ten

agreements have been concluded on the construction of nuclear science centers – with Bolivia, Nigeria, Rwanda, Serbia, Vietnam, etc.

Some Russian NPP construction projects

© PIR Center

Source: https://www.rosatom.ru/en/investors/projects/

LEGAL PRACTICE OF RUSSIA IN ORGANIZING COOPERATION IN PEACEFUL USES OF NUCLEAR ENERGY

In the Russian practice, the following chain of agreements is usually concluded with foreign partners who wish to cooperate in the peaceful use of nuclear energy.

First comes the *memorandum of understanding* between Rosatom State Corporation and its counterpart. This document declares the mutual intent for cooperation and sets up a bilateral mechanism for talks.

Next comes the *framework intergovernmental agreements* which establishes general parameters for cooperation. Unlike memorandums, it contains legally binding obligations at the level of the governments of the two countries. Such agreements may record areas of cooperation, for example, fundamental and applied research; construction and operation of nuclear reactors; radioisotopes and their use in industry, medicine and agriculture; nuclear safety, radiation protection; education, etc. They could also enumerate forms of cooperation: working meetings, scientific seminars; exchange of scientific, technical information; creation of competent or executive bodies; obligations on transfer of technology; compliance with export control obligations; protection of intellectual property rights, etc.

If the two sides are prepared to start an advanced cooperation, they conclude an *intergovernmental agreement on the construction of a nuclear power plant* (*or a nuclear science center*). This treaty contains obligations of the exporting state: location, type of the NPP, conditions and terms of its construction. Obligations of the host state contain data on the construction site and assistance to the exporting side. The agreement also contains obligations on the nomination of executive organs, exchange of information and technologies, export control and nuclear nonproliferation, etc.

"We had talks with several countries on building a nuclear power plant, including with Russia. As a result, Madam Prime Minister chose Russia as our partner in the field of peaceful nuclear energy. In 2011, we signed a memorandum of understanding with the State Corporation ROSATOM. It became foundation for the subsequent construction of the Rooppur NPP. Russia provided us with about 500 million dollars as the first tranche. In 2013, we signed the framework agreement to build a nuclear power plant in Bangladesh, in the city of Dhaka, not far from our capital. I must say that this is not just any nuclear power plant. This is a Generation III+ project. The Rooppur NPP will be equipped with VVER-1200 nuclear reactors. They also function in the power units of Novovoronezh NPP, which is a template NPP for us. Russia then provided us with new loans… But I want to emphasize that our joint project with ROSATOM to build the Rooppur Nuclear Power Plant is massive, and it will definitely go down in history. I cannot even say when something equal could be achieved… India itself is building the Kudankulam NPP together with the State Corporation ROSATOM. In 2017, they agreed on the construction of its fifth and sixth units. We also have a trilateral treaty on cooperation between Russia, India and Bangladesh in the field of peaceful nuclear energy".

Saiful Hoque, Ambassador Extraordinary and Plenipotentiary of the People's Republic of Bangladesh to Russia with concurrent accreditation to Belarus, Latvia, Lithuania, Estonia and Ukraine (2009-2019), in an interview for PIR Center
July 26, 2023
Source: https://pircenter.org/en/editions/our-joint-project-with-rosatom-to-build-the-rooppur-nuclear-power-plant-is-massive-and-it-will-definitely-go-down-in-history-interview-with-h-e-s-m-saiful-hoque/

Additional agreements may be dedicated to financial terms, assistance in case of nuclear emergencies, training of personnel and education, opening of information and learning centers; supply of fresh fuel and return of spent fuel, etc.

Many countries are not ready to immediately start the construction of NPP. Therefore, they choose an intermediate option – creation of nuclear science centers with a research nuclear reactor, where they can conduct experiments, create radioisotopes, and, most importantly, train qualified personnel.

Russia also supplies enriched nuclear fuel abroad and takes away spent fuel. Recently, a number of countries have expressed interest in purchasing Russian floating nuclear power plants of the *Akademik Lomonosov* type and small modular reactors for use in remote and inaccessible areas. Russia is ready to further expand large-scale, non-discriminatory, mutually beneficial cooperation with interested countries regardless of the Western futile sanctions.

TASKS FOR THE DEVELOPMENT OF THE INTERNATIONAL NUCLEAR LAW AND PRACTICE

It is clear that a solid, highly sophisticated conventional system of the international nuclear law has been developed. It provides adequate answers to main problems and trends of the global nuclear energy. However, an increasing number of *newcoming* countries wish to join the *nuclear energy club*. New technologies are on the threshold

of a large-scale industrial application. It requires to enhance existing legal rules of the international nuclear law.

In the nearest future it would be important:

- to further improve standards and norms of the nuclear safety and nuclear security under the IAEA;
- to further assist *newcomers* in creating laws, infrastructure, training personnel;
- to continue ecological rehabilitation of radiological contaminated areas;
- to create under the IAEA a mobile international emergency response mechanism in case of large nuclear disasters, composed of voluntary contributions;
- to create guidelines for new technologies such as floating NPPs and small modular nuclear power plants in export scenarios;
- to initiate legal frameworks at the UN level to prohibit deliberate military attacks on nuclear facilities and qualify those as international crimes. ■

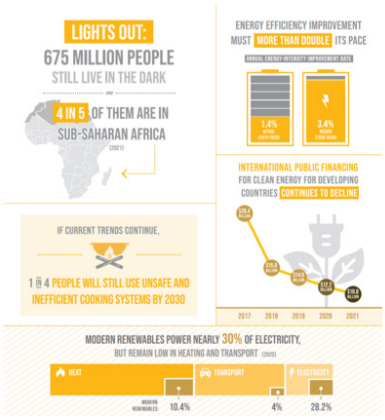
PAPER 19.

NUCLEAR ENERGY AND ITS PEACEFUL USES: PHYSICAL FOUNDATIONS AND TECHNOLOGICAL PROCESSES

Vladimir Kuchinov

UN Sustainable Development Goals

Source: https://digitalcommons.imsa.edu/unsdg_infographics/



Sustainable Development Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all

Source: https://www.un.org/sustainabledevelopment/sdg-fast-facts/

Nuclear energy today plays an important role in the production of thermal and electrical energy, as well as in medicine, industry and agriculture, being an indispensable tool for ensuring health, scientific knowledge and ensuring the yield and safety of food products. According to the International Atomic Energy Agency (IAEA) nuclear energy is capable to contribute directly to the achievement of nine of the 17 UN Sustainable Development Goals (SDGs). Indirectly, they can contribute to the achievement of all these goals[79].

These Paper serves to better understanding of the physical foundations of nuclear energy use both for the production of electrical and thermal energy, and for non-power purposes.

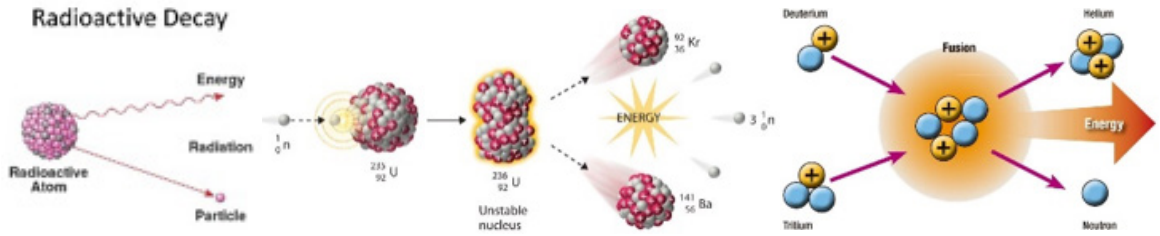
SOME BASIC DEFINITIONS

▶ *Energy* is a general quantitative measure of the movement and interaction of all kinds of matter and the ability to produce work or heat. Energy does not arise from noth-

[79] How the IAEA Will Contribute to the Sustainable Development Goals // IAEA.

ing and does not disappear; it can only pass from one form to another (the law of conservation of energy). Thermal energy, potential energy, kinetic energy and nuclear energy are some of the forms of energy.

▶ *Nuclear energy* is interaction of nuclear forces and released through nuclear decay and nuclear reactions, such as fission or fusion.



Source: open data

The unit of energy measurement in nuclear physics is the electron volt. The electron volt means the energy gained be an electron (a negative charged particle) passing potential difference of an electric field of 1 volt.

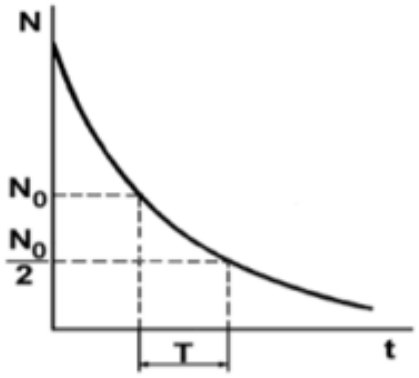
$$1eV \approx 1{,}60218 \cdot 10^{-19}\ J$$

▶ *Nuclear decay* means the process of disintegration of a nucleus, which is inherently a stochastic process. A necessary condition for radioactive decay is that the mass of the initial nucleus must exceed the sum of the masses of the decay products. Therefore, each radioactive decay occurs with the release of energy. Typical radioactive decay curve looks as follows:

Mathematical formula of nuclear (radioactive) decay is $N = N_0 e^{lt}$, where l is the constant of radioactive decay.

The rate of decay of any isotope can be represented by its characteristic half-life, the period required for one half of the radioactive material originally present to undergo radioactive decay – $T_{1/2}$. Relationship between l and $T_{1/2}$ is as follows $T_{1/2} = 0{,}693l$.

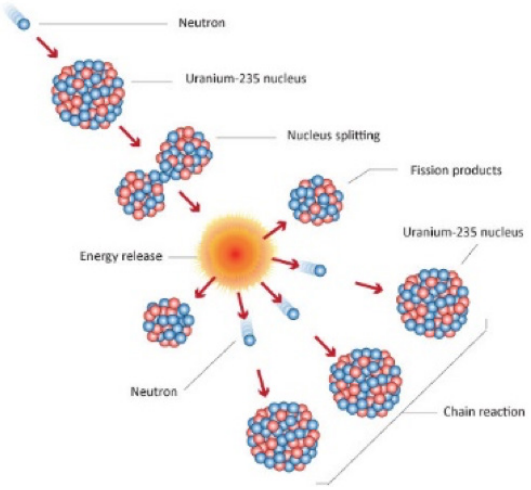
The International System of Units defines as the unit of radioactive decay the becquerel (Bq) which equals one transformation (or decay or disintegration) per second.



Example: Energy release from ^{60}Co decay into ^{60}Ni is equal 18.77 W/g.

▶ *Nuclear fission* is the process of splitting an atomic nucleus into two or more smaller nuclei, accompanied by the release of a large amount of energy.

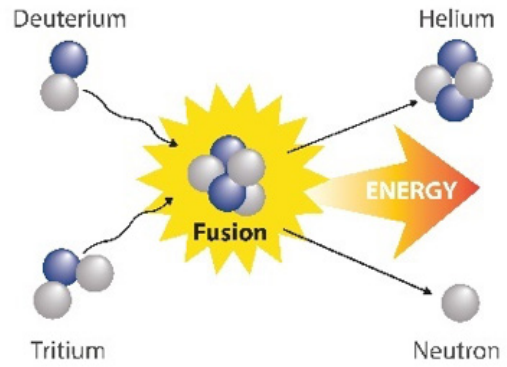
▶ *Nuclear fission chain reaction* is the base for nuclear reactor technology for commercial power production today.



Source: open data

▶ *Nuclear fusion* is the process by which two atomic nuclei are fused together to form a heavier nucleus, releasing a large amount of energy. Fusion reactions take place in a state of matter called plasma – a hot, charged gas made of positive ions and free-moving electrons with unique properties distinct from solids, liquids or gases. Scientists from many countries are working on the problem of using controlled thermonuclear fusion of a-particles (helium) from deuterium and tritium.

The main problem is to retain and thermally isolate the plasma. Scientists and engineers have been working on solving this problem to develop nuclear fusion as a source of clean energy, but it is not yet a case.



Source: open data

All technologies using nuclear energy for power and non-power applications are based on phenomena of radioactivity and interaction of radiation or products of nuclear reactions with atoms and molecules of a substance resulting in the change of atoms or molecules or their condition or the radiation itself, as well as in release of energy.

GENERATION OF POWER

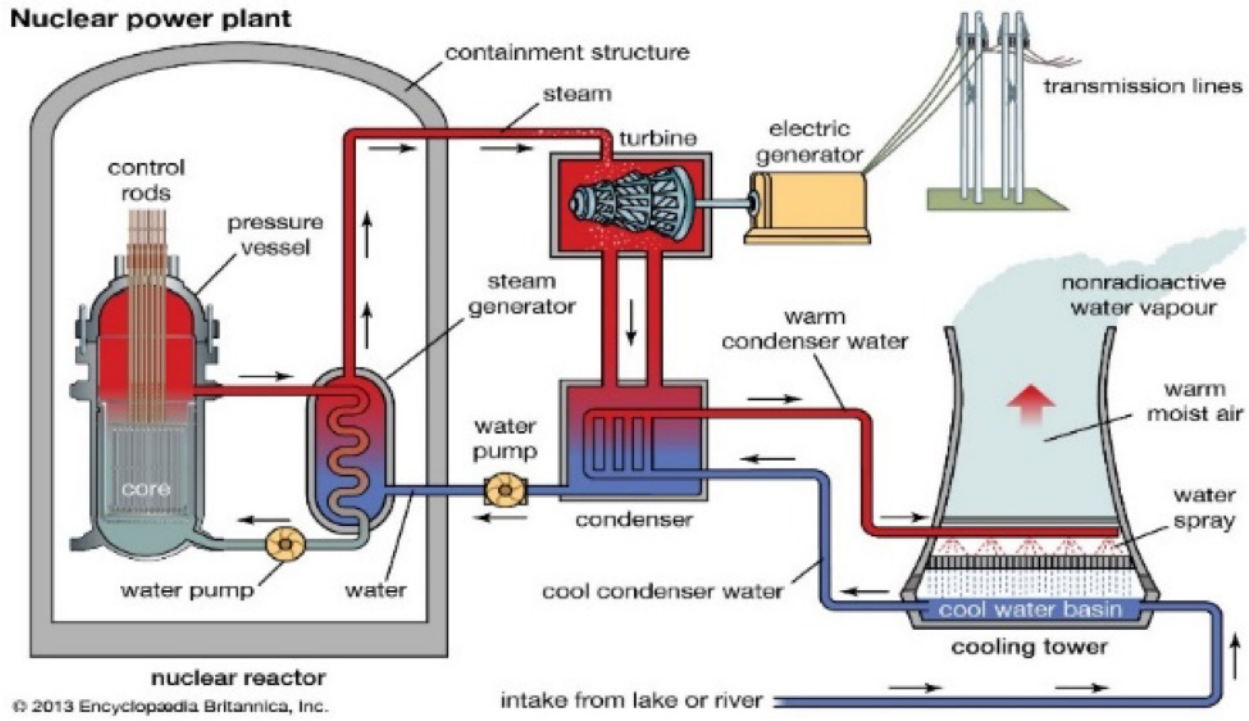
There are three technologies based on the use of nuclear energy for power production today: two of them are based on nuclear reactions (fission of uranium and plutonium isotopes by neutron and fusion of hydrogen isotopes); one of them is based on nuclear decay.

The only nuclear technology used currently to convert commercially nuclear energy into electricity or heat is based on a nuclear fission reaction. Thermo-electricity sources based on nuclear decay – radioisotope thermoelectric generators (RTG, RITEG) are used for special remote applications requiring continuous power over a long period of time in unattended mode such as space flight or lighthouses.

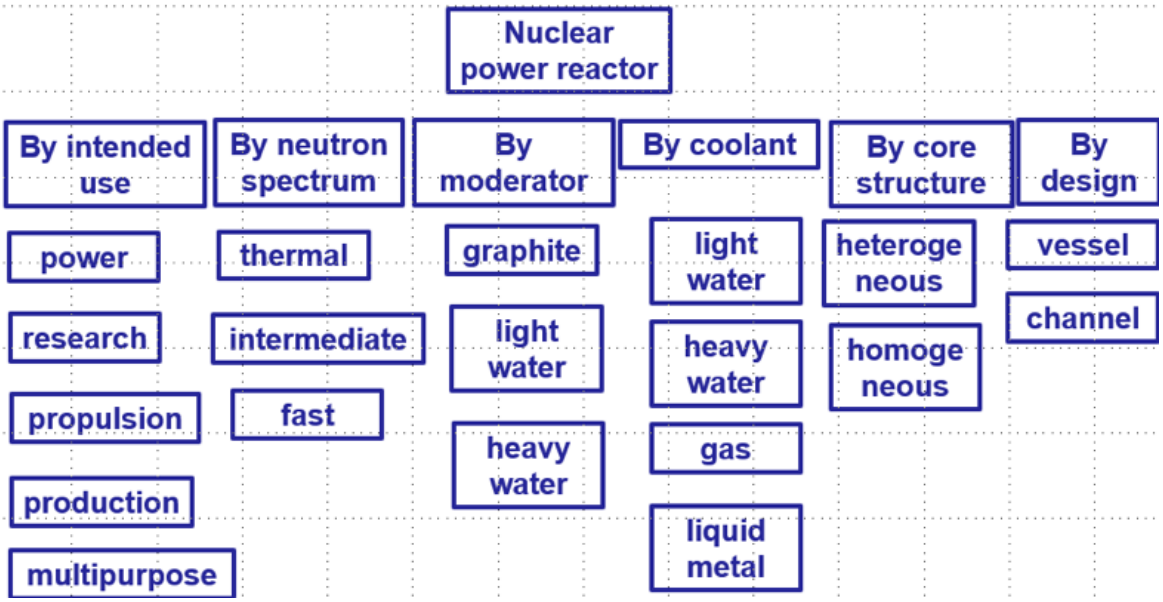
NUCLEAR POWER REACTORS

A *nuclear reactor* is a device capable of operating in such a way as to maintain a controlled self-sustaining fission chain reaction. It mainly consists of a reactor vessel (or a specially

designed compartment) to accommodate the core, equipment that controls the power level in the core, and components that usually contain, come into direct contact with, or control the coolant of the primary circuit of the reactor core.



Source: open data



Nuclear power reactors classification

Source: open data

A nuclear reactor serves as a kind of *boiler* at a nuclear power plant to produce steam, which is then used to power a conventional steam turbine, connected to an electric generator in much the same way as in fossil fuel plant generating electricity.

MAIN NUCLEAR POWER REACTOR DESIGN

▶ *Pressurized Water Reactor* (PWR) is characterized by having a primary cooling circuit in which water flows through the reactor core under very high pressure, and a secondary circuit in which steam is generated to drive the turbine. Water in the reactor core reaches about 330°C under pressure of 16 MPa (160 bar) to prevent its boiling. The PWR uses low enriched uranium oxide fuel (up to 5 percent) and ordinary (light) water as moderator and cooling agent.

▶ *Boiling Water Reactor* (BWR) design has many similarities to the PWR, except that there is only a single circuit in which the water is at lower pressure about 7 Mpa (70 bar) so that it boils in the core at about 283°C. The BWR uses low enriched uranium oxide fuel (about 4 percent) and ordinary (light) water as moderator and cooling agent.

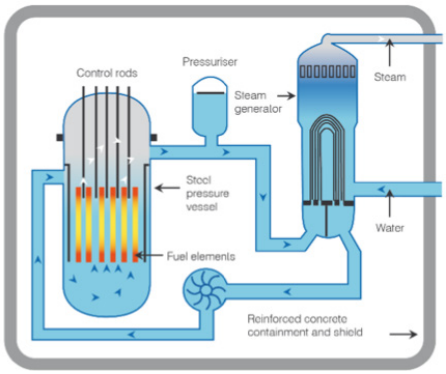
▶ *Advanced Gas Cooled Reactor* (AGCR) is a graphite moderated and gas cooled reactor. The gas coolant CO_2 can be heated to higher temperatures than water reaching about 600°C enabling higher plant efficiencies of up to 40 percent to be achieved. Higher temperature operation is made possible by cladding ^{235}U in stainless steel tubes. At the same time stainless steel tends to absorb neutrons so the uranium oxide fuel is slightly enriched 2.2-2.7 percent to compensate this effect.

▶ *High Temperature Gas Cooled Reactor* (HTGR) is also a graphite moderated gas cooled reactor. Helium is used as the coolant to allow high working temperatures about 800°C. The reactor core can be either a *prismatic block* (reminiscent of a conventional reactor core) or a *pebble bed* core (a loosely packed bed of spherical fuel elements through which cooling gas is pumped). The spherical fuel elements called pebbles. These tennis ball-sized elements (approximately 6.7 cm or 2.6 in in diameter) are made of pyrolytic graphite (which acts as the moderator), and contain thousands of fuel particles called tri-structural-isotropic (TRISO) particles. These TRISO particles consist of a fissile material (^{235}U) enriched less than 20 percent surrounded by a ceramic coating of silicon carbide for structural integrity and fission product containment. Thousands of pebbles are used to create a reactor core.

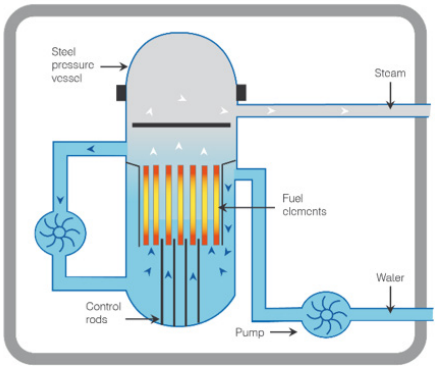
▶ *Pressurized Heavy Water Reactor* (PHWR) is a channel type reactor designed and developed in Canada since the 1950s and known as the CANDU (Canadian deuterium uranium). PHWRs generally use natural uranium (0.7 percent ^{235}U) oxide as fuel, hence needs a more efficient moderator, in this case heavy water (D_2O).

▶ *Channel Type Graphite Moderated Boiling Water Reactor* is a reactor designed in the USSR and known as RBMK. The reactor consists of large pile of graphite blocs with small, tubed channels (pressure tubes) running through it. Some channels house the fuel and control rods while others allow for coolant flow. The enrichment of fuel was initially 2.0 percent, now slightly more.

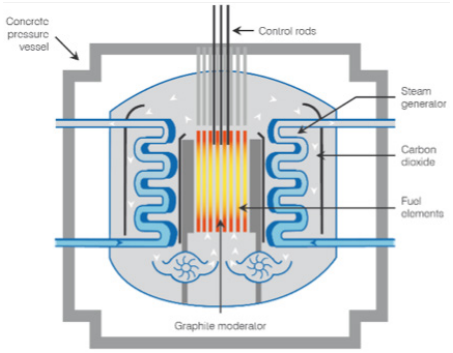
▶ *Fast Neutron Reactor* (FNR) is a reactor in which the fission chain nuclear reaction is sustained by fast neutron spectrum. It allows to increase the energy yield from natural uranium as compared to thermal reactors. Usually, this rector type has a pool design and has a high-power density and are normally cooled by liquid metal such as sodium, lead, or lead-bismuth, having high thermal conductivity and boiling point and no moderating ef-



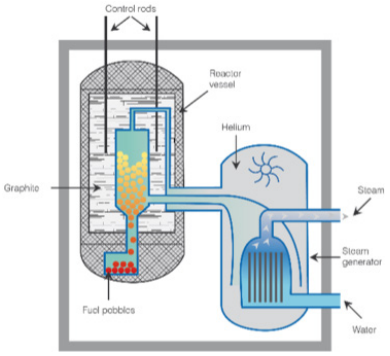
Pressurized Water Reactor



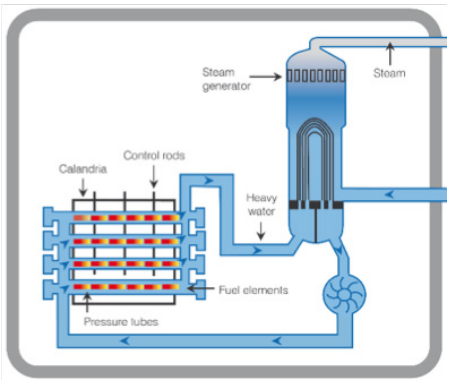
Boiling Water Reactor



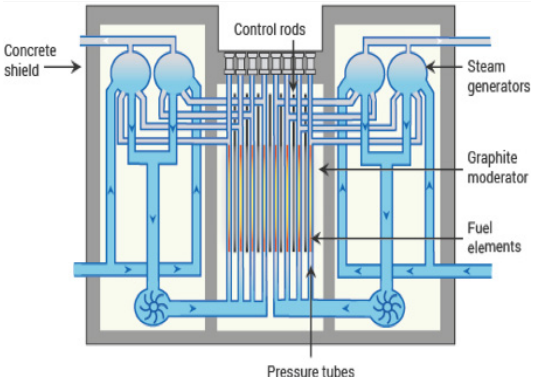
Advanced Gas Cooled Reactor



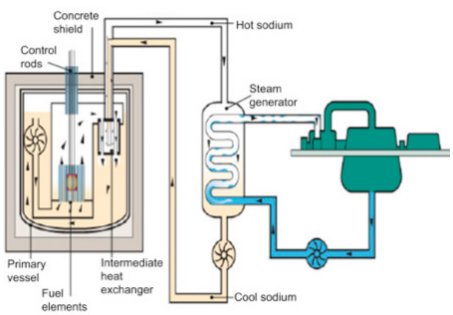
High Temperature Gas Cooled Reactor



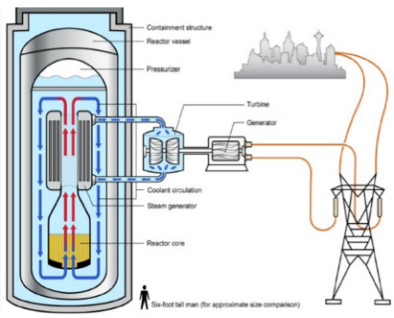
Pressurized Heavy Water Reactor



Channel Type Graphite Moderated Boiling Water Reactor



Fast Neutron Reactor



Small Modular Reactor

Source: open data

fect. This reactor operates at around 500-550°C at or near atmospheric pressure. High enriched uranium or mixture of uranium (natural or depleted) and plutonium or mixture of thorium and 233U can serve as nuclear fuel for this reactor type. Fast reactors typically use boron carbide control rods.

Nuclear reactors selected for generation IV nuclear energy systems or advanced nuclear reactors are gas cooled fast and thermal neutron reactors, lead or sodium cooled fast reactors, molten salt fast and thermal neutron reactors, supercritical water-cooled reactors and high temperature gas cooled reactors. These reactors can be designed having different size and installed electrical capacity.

▶ *Small Modular Reactors* (SMRs) are advanced nuclear reactors that have a power capacity of up to 300 MW(e) per unit, which is about one-third of the generating capacity of traditional nuclear power reactors. SMRs, which can produce a large amount of low-carbon electricity, are: small – physically; modular – making it possible to be factory-assembled and transported as a unit to a location for installation; reactors – harnessing nuclear fission to generate heat to produce energy. More than 80 commercial SMR designs being developed around the world target varied outputs and different applications, such as electricity, hybrid energy systems, heating, water desalination and steam for industrial applications.

NUCLEAR FUEL CYCLE

▶ *Nuclear fuel cycle* are several process stages in the production of nuclear fuel for nuclear reactors and in the area of used (spent) nuclear fuel management and waste treatment area. All process stages starting from uranium mining up to the nuclear power plant (NPP) are called as *front-end*, after – *back-end.*

▶ *Uranium production* starts with uranium mining (open or underground) or from in situ leaching (ISL), also known in North America as solution mining, or in situ recovery (ISR), or recovery as by-products from phosphoric acid, coal, gold, copper, and vanadium production.

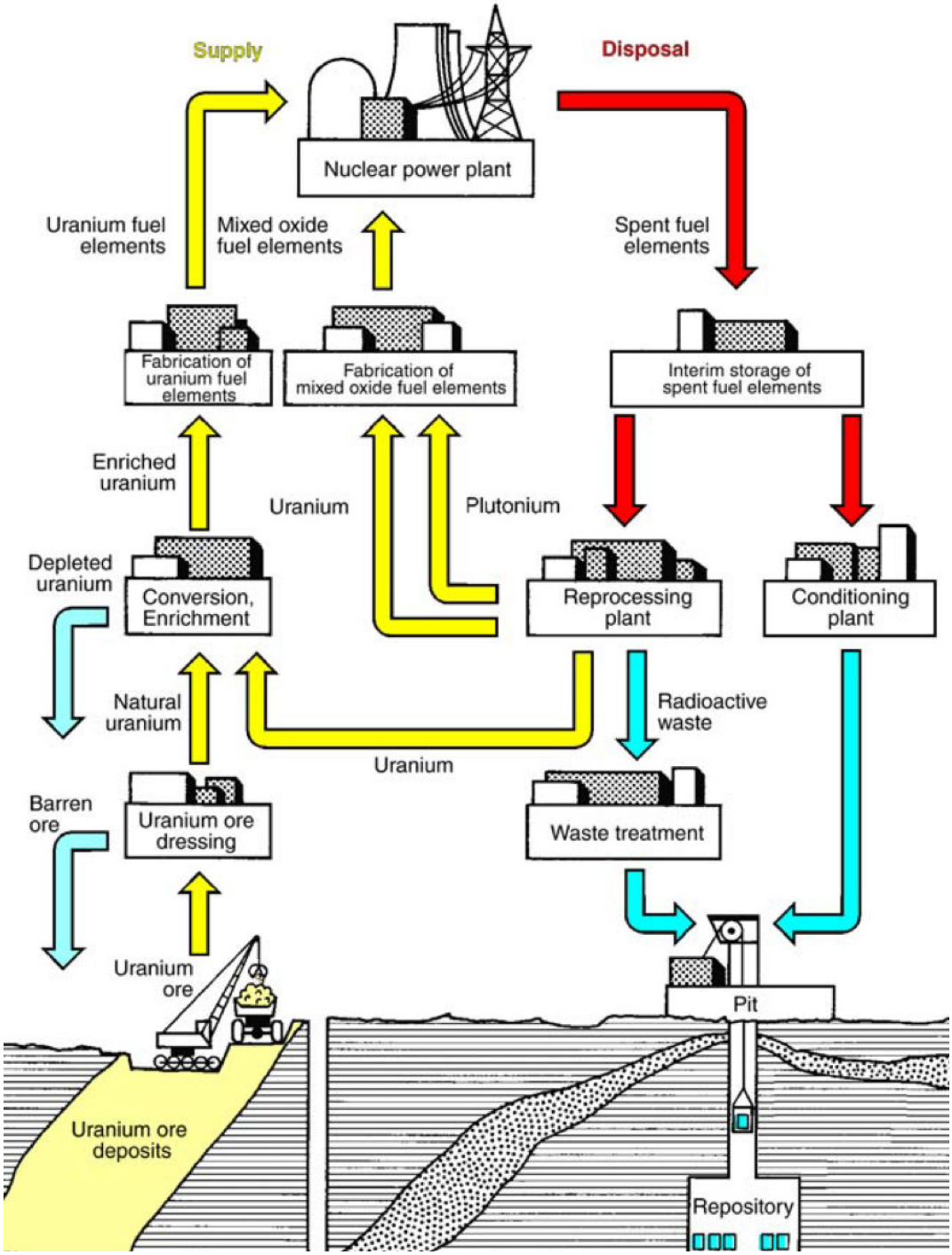
At the mill of a conventional mine, or the treatment plant of an ISL operation, the uranium extracted from nitric solution by ion exchange before being dried and packed, usually as U_3O_8 (uranium oxide) called uranium ore concentrate (UOC).

▶ *Uranium conversion* is the next step in front-end of fuel cycle to chemically separate impurities from UOC and produce very high purity products to tight specifications. The product either very pure uranium dioxide (UO_2) for production of fuel for reactors using natural U or very pure uranium hexafluoride (UF_6) for uranium isotope enrichment for fuel production for reactors using enriched U.

▶ *Uranium Isotope Enrichment* (*Uranium Enrichment*, *Uranium Isotope Separation*) is a process in which the percent composition of ^{235}U is increased through the process of isotope separation. Natural uranium contains 0.7 percent of the ^{235}U isotope. The level of enrichment required depends on the specific reactor design and specific requirements of the nuclear power plant operation. Usually for light water reactors this level lies between 3-5 percent.

Methods of uranium isotope separation are:

- diffusion methods (gaseous diffusion, thermal diffusion);
- gas centrifugation;
- laser methods, including atomic vapor laser isotope separation (AVLIS), molecular laser isotope separation (MLIS), separation of isotopes by laser excitation (SILEX);
- other methods (aerodynamic processes, electromagnetic isotope separation, chemical methods, plasma separation).



Source: open data

▶ *Nuclear fuel production* is the last step in the process of turning uranium into nuclear fuel rods or nuclear fuel assembly. At the nuclear fuel plant, the low enriched uranium in form of UF_6 is converted into UO_2. The UO_2 powder is used to press pellets which are sintered at temperatures of more than 1700 °C, filled into seamlessly drawn cladding tubes made of a zircon alloy and sealed gas-tight. Individual fuel rods are grouped into fuel assemblies. These nuclear fuel assemblies are complex product designed to meet design specification with very demanding safety and licensing requirements.

▶ *Used (spent) fuel* is a nuclear fuel that has been irradiated in a nuclear reactor (usually at a nuclear power plant or an experimental reactor) and must be replaced because the neutron-absorbing fission products have built up and the fuel becomes significantly less able to sustain a nuclear chain reaction. Discharged used fuel is due to the presence of a high amount of radioactive fission fragments and transuranic elements are very hot and very radioactive. For about the first 100 years, light water reactor (LWR) spent fuel emits gamma radiation at a dose rate greater than 1 sievert per hour, which would be lethal to about 50 percent of adults (LD50) in three to four hours. There are two different management strategies for used nuclear fuel: it is simply considered as nuclear waste and is stored pending final disposal (open fuel cycle), or it is reprocessed to extract usable material (uranium and plutonium) for new fuel (closed fuel cycle).

Long term storage of used fuel is becoming a progressive reality. There are *wet* and *dry* methods of storage of used nuclear fuel.

▶ *Wet* storage is a storage of used nuclear fuel in pool filed with water ensuring the removal of decay heat and providing protection from radiation. It also provides the possibility to control the fuel's condition, including by visual means.

▶ *Dry* storage is a storage of used nuclear fuel in special casks using air or inert gas instead of water for cooling purposes. Several design options exist for storage facilities based on the *dry* storage technology including reinforced concrete silos, concrete modular units, etc.

▶ *Geological disposal* is a method to dispose used nuclear fuel or containers with high level of radioactive waste deep under-ground in geological formation. Building geological disposal facilities has today become possible with the modern technologies.

▶ Used (spent) fuel reprocessing is a technology that recovers valuable materials from used nuclear fuel, reducing the volume of radioactive waste and providing nuclear material for nuclear fuel for nuclear reactors. The process has been developed as a means to minimize nuclear waste and improve resource utilization in the nuclear industry.

The reprocessing technology currently in commercial use is based on PUREX (plutonium-uranium extraction) process or its variation such as, UREX (uranium extraction). PUREX process separates uranium and plutonium very effectively. It involves dissolving the fuel elements in concentrated nitric acid then chemical separation of uranium and plutonium is undertaken by solvent extraction steps. The one divergent from PUREX process reprocessing technology currently under development is pyro-processing. It is a generic term for high-temperature methods separation of uranium and plutonium. Solvents are molten salts (e.g., LiCl + KCl or LiF + CaF2) and molten metals (e.g., cadmium, bismuth, magnesium) rather than water and organic compounds.

▶ *Mixed uranium-plutonium fuel* – is nuclear fuel fabricated either from mixture of uranium and plutonium oxides (MOX) or from nitrides or carbides or metal. MOX fuel contains usually about 7 percent of rector-grade plutonium forming equivalent to a typical enriched uranium fuel.

▶ *Radioactive wastes* (RWs) are produced from the use of nuclear technologies for energy production, research activities, medical and industrial applications, as well as from both legacy and current military use. In accordance with the IAEA, six classes of radioactive waste are established as follows[80]:

- Exempt waste (EW);
- Very short-lived waste (VSLW);
- Very low-level waste (VLLW);
- Low level waste (LLW);
- Intermediate level waste (ILW);
- High-level waste (HLW).

Different kind of disposal facilities for all categories of radioactive waste, except high level waste and/or spent fuel (declared as waste), are operational worldwide.

▶ *Decomissioning of nuclear installations* is a process leading to the irreversible complete or partial closure of a nuclear installation, usually a nuclear reactor, with the ultimate goal of terminating the operation license. The process usually takes place in accordance with a decommissioning plan, including the complete or partial dismantling and decontamination of the installation, which ideally leads to the restoration of the environment up to the status of a *green or brown lawn*. The decommissioning plan is executed when the approved final state of the installation has been reached.

Applications of nuclear energy not only for production of electricity could present sustainable solutions for several energy challenges of current and future generations. The main area of such applications is considered to be: district and technological heat supply; water desalination; production of hydrogen; propulsion at sea and on land.

Compared to oil or coal fueled ships, nuclear propulsion offers the advantages of very long intervals of operation before refueling as well as absence of oxygen consumption and CO2 emission. Operation of a civil or naval ship power plant is like land-based nuclear power reactors.

NON-POWER APPLICATION OF NUCLEAR ENERGY

Nuclear technologies for non-power applications are used in the modern world in various fields of human activity – from fundamental and applied research to applications in industry, medicine, agriculture and environmental protection. Regardless of their actual use of nuclear technologies for non-power applications they are based on phenomena of radioactivity and interaction of radiation or products of nuclear reactions with atoms and

[80] Find more: Classification of Radioactive Waste // IAEA Safety Standards General Safety Guide № GSG-1.

molecules of a substance resulting in the change of atoms or molecules or their condition or the radiation itself.

For non-power application it is very important the following phenomena:

- penetration capabilities of radiation and attenuation of radiation by different substances;
- ionization of substance by radiation;
- spectral characteristics of radiation;
- methods of registration of radiation;
- decay characteristics (half-life and decay chain).

Penetrating and attenuation phenomena of radiation is used in different kind of radiography in industry, science, medicine, etc.

Using the technology of irradiation of some object, it is possible to synthesize new chemical compounds, to produce polymerization, vulcanization and cross linking of polymers, wastewater purification, to give new properties of solid materials, in particular semiconductors, as well as sterilizing medical materials and instruments, food and agricultural products.

Detection of radioactivity or its measurement is based on interaction of radiation with matter such as interaction with photographic emulsions, ionization (Geiger-Muller counter), using effect of emitting by some crystals small flashes of light when bombarded by γ-rays (sodium iodine), the effect of changing of semi-conductor conductivity under γ irradiation, heating of the substance (calorimetry).

PROSPECTS FOR USE OF NUCLEAR POWER

Technological trends that will shape the future of the nuclear fleet from current period up to 2050 include:

- managing the existing fleet to allow for safe and economical long-term operation;
- evolutionary development of Generation III to Generation III+ LWR technologies with a focus on safety improvements, simplification, standardization, cost and construction time reduction;
- development of small and medium reactor technologies especially those that rely on LWR technologies, though their deployment is not expected to be significant by 2030;
- Generation IV reactors and non-electric applications of nuclear energy to address the need for low-carbon process heat, actinide management, district heating, or desalination.

Advanced reactors such as FBRs will be developed together with nuclear fuel cycle closure.

Prospects for further development of nuclear technologies for power production (electric and non-electric) depends on many issues and involves a lot of uncertainties. In an increasingly competitive and international global energy market several key factors will affect not only the energy choice, but also the extent a way of different energy sources is

used. These include: optimal use of available resources; reduction of overall costs; minimizing environmental impacts; convincing demonstration of safety; and meeting national and global policy needs.

In its annual projection made in 2023 the IAEA has revised earlier scenarios made by the Agency for nuclear power development[81]. In both its high and low case scenarios, the IAEA now sees a quarter more nuclear energy capacity installed by 2050 than it did as recently as 2020, underscoring how a growing number of countries are looking to this clean and reliable energy source to address the challenges of energy security, climate change and economic development[82]. In the high case scenario of the new projection, nuclear installed capacity is seen more than doubling by 2050 to 890 GW(e) compared with today's 369 GW(e). In the low case, capacity increases to 458 GW(e). From last year's outlook, the high and low cases have risen by 2 percent and 14 percent, respectively. Despite the optimistic outlook, challenges inherent in climate change, financing, economic considerations, and supply chain complexities persist and might hamper the industry's growth.

PEACEFUL USE OF NUCLEAR ENERGY AND NUCLEAR NONPROLIFERATION

The specifics of the peaceful use of nuclear technologies and nuclear energy consist of the fact that nuclear weapons and civilian nuclear power are based on the same physical laws. The same technological processes are used for the production of nuclear fuel for civilian nuclear reactors and nuclear materials for nuclear weapons. The civilian nuclear industry does use fissile materials, theoretical knowledge and technical experience that can be used in nuclear weapons programs but is poorly adapted for obtaining weapons-grade nuclear materials. The peaceful use of nuclear technologies can become a channel for the proliferation of nuclear weapons.

▶ *Technical nuclear proliferation capabilities* are associated with at least five key factors:

- scientific and engineering personnel;
- scientific and technological base;
- obtaining or acquiring weapons-grade fissile materials;
- technological basis for the manufacturing of nuclear weapons or nuclear explosive devices;
- the possibility of testing.

The development of civilian nuclear technologies in the direction of resistance to nuclear proliferation can reduce the potential for nuclear proliferation.

▶ *Nuclear proliferation resistance* is defined as a characteristic of a nuclear energy system that prevents the diversion or undeclared production of nuclear material or the misuse of technology by non-nuclear-weapon states intending to acquire nuclear weapons or other nuclear explosive devices. The resistance of the nuclear energy system to the proliferation of nuclear weapons can be viewed from the point of view of internal characteristics and external institutional measures.

[81] IAEA Annual Projections Rise Again as Countries Turn to Nuclear for Energy Security and Climate Action // IAEA.
[82] Ibid.

Nuclear proliferation resistance

▶ **Internal characteristics**

Definition: Those characteristics that result from the technical design of nuclear energy systems, including those that facilitate the implementation of external measures.

Examples: isotopic content of nuclear material; chemical form of nuclear material; radiation field from nuclear material; heat generated by nuclear material; the rate of spontaneous neutron generation from nuclear material; complexity and time required for modifications required to use civilian nuclear material for a weapons production facility; mass and volume of nuclear material; skills, experience and knowledge required to switch or produce nuclear material and convert it into a form suitable for use in weapons; the time it takes to divert or produce nuclear material and convert it into a form suitable for use in weapons; design features that restrict access to nuclear material.

▶ **External measures**

Definition: Those measures that are the result of political decisions and obligations of states related to nuclear energy systems, and which are aimed at countering nuclear proliferation.

Examples: Nuclear Nonproliferation Treaty, IAEA safeguards system.

Multilateral fuel cycle centers as a way of handling used nuclear fuel and separated plutonium, as well as obtaining low-enriched uranium for nuclear fuel for non-nuclear-weapon countries that have abandoned national uranium isotope enrichment and reprocessing plants, can become a real opportunity to reduce the potential for nuclear proliferation associated with the development of nuclear energy. ■

PAPER 20.

NUCLEAR SAFETY AND NUCLEAR SECURITY

Alexey Ubeev

BASIC DEFINITIONS OF NUCLEAR SAFETY AND NUCLEAR SECURITY

According to the IAEA Safety Glossary, nuclear safety is the achievement of proper operating conditions, prevention of accidents and mitigation of accident consequences, resulting in protection of workers, the public and the environment from undue radiation risks[83]. As for nuclear security, it is the prevention and detection of, and response to, criminal or intentional unauthorized acts involving or directed at nuclear material, other radioactive material, associated facilities or associated activities[84]. Those definitions are still under discussion.

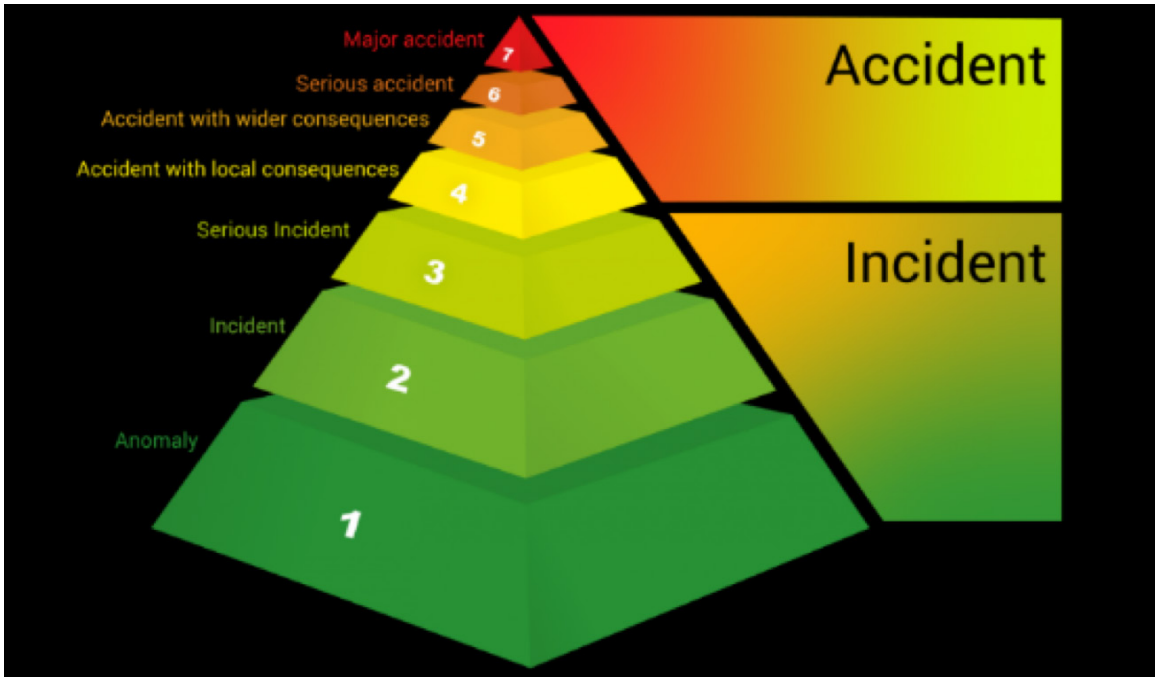
Main concerns for nuclear safety are radiological risks to human and environment, whatever the cause. For nuclear power plants (NPP) causes it could be human errors, equipment failure, internal events (fire, pipe break, etc.) and external events (earthquakes, flooding, etc.). Main concerns for nuclear security are the theft of nuclear and other radioactive material and sabotage of a nuclear facility or nuclear and radioactive material in storage or in transportation, or any another malicious act.

The International Nuclear and Radiological Event Scale (INES) is a tool for communicating the safety significance of nuclear and radiological events to the public. Member states of the IAEA use INES on a voluntary basis to rate and communicate events that occur within their territory. It is not a notification or reporting system to be used in emergency response. Member states use INES to provide a numerical rating that indicates the significance of nuclear or radiological events.

- Events are rated at seven levels. The scale is logarithmic – that is, the severity of an event is about ten times greater for each increase in level of the scale.
- Events are considered in terms of:
  - Impact on people and the environment;
  - Impact on radiological barriers and control;
  - Impact on defense in depth.
- Events without safety significance are rated as Below Scale/Level 0.
- Events that have no safety relevance with respect to radiation or nuclear safety are not rated on the scale.

Source: https://www.iaea.org/resources/databases/international-nuclear-and-radiological-event-scale

[83] IAEA Nuclear Safety and Security Glossary, 2022 / IAEA.
[84] Ibid.



Are safety and security contradictory to each other or not? Both terms have a common objective to protect people, property and environment from radiological hazards. But at the same time, there are points of potential conflict between the measures taken in each area to accomplish that objective, for example:

- safety requirements for emergency egress vs security requirements to minimize access points;
- safety requirements for transparency vs security requirements to maintain confidentiality of security information.

Designers and operators of the NPPs must take care to ensure that security measures do not compromise safety and that safety measures do not compromise security. Specialists try to reach a consensus on the security and safety approaches. The acceptable risk should be the same whether the initiating event of a radiological release is due to human and equipment failures, internal and external events or an event of malicious origin. The workers, public, and environment are subjected to threats arising from both safety and security related hazards. A more effective protection of people and the environment can be achieved through a proper interface or even synergy of both nuclear safety and nuclear security.

NUCLEAR TERRORISM

By the way, there are more than 20 conventions dealing with nuclear terrorism, but there is no universally recognized definition of what terrorism means.

The three types of nuclear or radiological terrorism can be indicated:

- detonation of a nuclear bomb, either a nuclear weapon from state's arsenal or improvised nuclear device made from stolen weapons-usable material;
- sabotage of a nuclear facility or transport with radioactive materials causing a large release of radioactivity;
- use of a radiological dispersal device or dirty bomb to spread radioactive material and create panic and disruption.

"Guards at the Zaporozhye nuclear power plant neutralize Ukrainian drones almost every day, said Konstantin Vorontsov, a deputy director at the Russian Foreign Ministry's department for nonproliferation and arms control. "Since July 2022, there have been drone attacks and episodes of gunfire targeting the city of Energodar, which were carried out by Ukrainian forces," he said at a meeting of the UN General Assembly First Committee, which deals with disarmament and international security matters. "These days, on an almost daily basis, guards at the plant neutralize numerous aircraft launched by Ukrainian militants for the purpose of attacks and provocations against the plant." "No attacks have ever originated on the territory of ZNPP. No heavy weapons or ammunition for them have ever been stored at the plant. There are no military personnel at the Zaporozhye NPP that could be used for attacks from the territory of the plant. The forces that are stationed at the Zaporozhye NPP are necessary to protect it and clean up any potential consequences of Ukrainian attacks," the diplomat said".

Guards at Zaporozhye nuclear plant neutralize Ukrainian drones almost daily – Russian MFA
TASS

October 17, 2023
Source: https://tass.com/defense/1691743

POTENTIAL NUCLEAR SECURITY THREATS

The first one is a nuclear weapon theft. The probability of this threat is rather low because the system of nuclear weapons physical protection is very sophisticated, contemporary, and updated. The next risk is the theft of nuclear fissile material for making an improvised nuclear device. Its probability is rather higher just due to the fact that plutonium 239 or uranium 235 are accessible in the world nuclear market. Also, the following threats to nuclear security can be indicated: theft of radioactive materials and sources, use of radioactive material out of regulatory control, as well as the sabotage at the nuclear facility or transport of material releasing radioactivity.

RADIOLOGICAL WEAPONS

There are two types of the radiological weapons.

The first one is a radioactive dispersion device (RDD). It is any means used to disperse radioactive material. For that aim, conventional explosives or an aerial sprayer can be used, for example. It could be put in a backpack, on a truck, board, and so on. Sometimes it is referred to as a dirty bomb, or a conventional high explosive bomb placed near a radioactive source.

Dirty bomb scenario
Source: open data

Another type of radiological weapon is radiation exposure devices (RED), which use materials to emit radiation. It is not a bomb at all. It is a highly radioactive source placed some-

where while unshielded. Among its likely targets are locations where many people would be exposed (subways, airports, office buildings, indoor stadiums, etc.). This type of radiological weapon is more dangerous because it provokes not only radiation, but also panic among the population.

COMPUTER AND INFORMATION SECURITY

These days, computer-based systems are used for ensuring physical protection, nuclear safety, nuclear material accountancy and control. They should be protected against compromise (e.g., cyberattack, manipulation or falsification) consistent with the threat assessment or design basis threat. Most of those systems exist as a complex network of embedded systems and computers. The cyberthreat for nuclear facilities is real; it is not something imaginary or sophisticated.

"The discovery of the so-called malicious software – malware – on systems in Iran and elsewhere across the world has prompted speculation of an attempted cyber attack on Iranian industry, possibly including the Bushehr nuclear reactor. The Stuxnet Trojan worm was designed to attack industrial control systems produced by Siemen's AG, which are commonly used to manage water supplies, oil rigs, power plants and other industrial facilities. It spreads from USB devices and exploits a vulnerability in Microsoft Corp's Windows operating system that has since been resolved. Once the worm infects a system, it sets up communications with a remote server computer that can be used to steal data or take control of the system, according to experts. Symantec, a US-based computer security services company, said that 60 per cent of the computers infected worldwide were in Iran. "It's pretty clear that based on the infection behavior that installations in Iran are being targeted," Kevin Hogan, the senior director of Security Response at Symantec, told the Reuters news agency. "The numbers [of infections in Iran] are off the charts," he said, adding Symantec had located the IP addresses of the computers infected and traced the geographic spread of the malicious code. Hogan said the virus's target could be a major complex such as an oil refinery, a sewage plant, a factory or water works… Kaspersky Labs, a European digital security company, said the attack could only be conducted "with nation-state support." "Stuxnet is a working and fearsome prototype of a cyber-weapon that will lead to the creation of a new arms race in the world," it said in a statement. Israel, which has admitted it has the capability to launch cyber attacks, has previously hinted it could attack Iranian facilities if international diplomacy fails to curb Tehran's nuclear ambitions. Western nations, including the US, are also at odds with Iran over its uranium enrichment programme… On August 31, Iranian atomic chief Ali Akbar Salehi blamed "severe hot weather" for a delay in moving fuel rods into its Russian-built first nuclear power plant. Stuxnet was identified by Belarussian firm Virusblokada in mid-June after it emerged on the computer of one of its clients in Iran".

Al Jazeera

September 24, 2010

Source: https://www.aljazeera.com/news/2010/9/24/cyber-attack-targeted-iran

INTERNATIONAL LAW IN THE INTERESTS OF NUCLEAR SECURITY

The basic documents for developing norms of nuclear security include:

- 1979 Convention on the Physical Protection of Nuclear Material and its 2005 Amendment;

- 2005 International Convention for the Suppression of Acts of Nuclear Terrorism;
- 2001 UN Security Council resolution № 1373;
- 2004 UN Security Council Resolution № 1540.

"The State's physical protection regime should seek to achieve these objectives through:

- Prevention of a malicious act by means of deterrence and by protection of sensitive information;
- Management of an attempted malicious act or a malicious act by an integrated system of detection, delay, and response;
- Mitigation of the consequences of a malicious act".

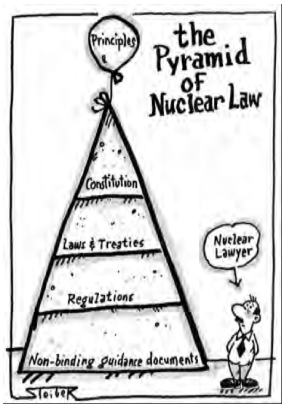
Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Revision 5)
IAEA Nuclear Security Series No. 13
2011

Source: https://www-pub.iaea.org/MTCD/Publications/PDF/Pub1481_web.pdf

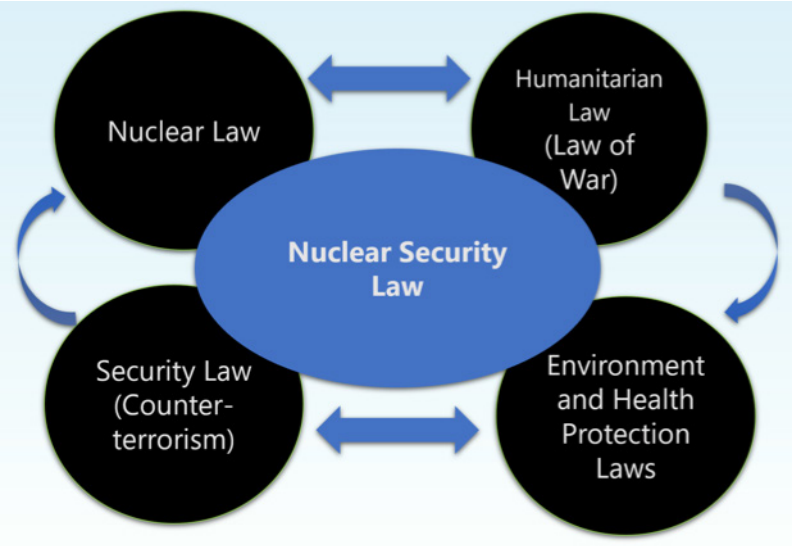
OUTCOMES

▶ Nuclear safety and nuclear security share the same objective: to protect people, property and environment from radiological hazards.

▶ The threat of nuclear and radiological terrorism is real and imminent. It demands a global, coordinated response.



The pyramid of nuclear law
Source: open data



▶ Threat and risk assessment serve to identify motivations, intentions, and capabilities of adversaries, potential targets and consequences.

▶ Coordination of response force and other national institutions is vital for neutralization of adversary and mitigation of the consequences of nuclear security incident. ■

PAPER 21.

INTERNATIONAL URANIUM MARKET: ITS LAWS, PLAYERS AND PITFALLS

Gleb Efremov

Nuclear energy has become one of the sufficient types of energy generation in many countries. Electricity and heat production in the nuclear power plant (NPP) is a result of fission reaction of uranium nuclei, or rather its isotope – uranium 235. Therefore, there is such a definition as the *uranium nuclear fuel cycle* covering the path of uranium from the moment when it is going to be excavated as a fossil raw material from the bowels of the Earth up to the moment the uranium fuel assembly is going to be placed in the reactor core at the nuclear power plant.

Uranium is a mineral, so energy generation is based on it is a non-renewable type. However, many aspects, primarily such as economic efficiency, lack of greenhouse emissions and stability, make this type of generation practically no-alternative against the backdrop of tightening environmental requirements for emissions and reducing hydrocarbon reserves.

Uranium is not an exchange-traded product. However, it has current and long-term price quotes. The values of price quotations form by consulting companies due to the relevant information about the price parameters of contracts concluded by participants of the market. Price changes occur due to various factors: dynamics of changes in proven reserves of natural uranium, nuclear incidents, mergers and acquisitions of nuclear companies, annual reports on production, financial results of companies and so on. Since there is a product, price quotes and participants in transactions, it means there is a market for the product. It is more correct to talk about two uranium markets: natural uranium market and enriched uranium market.

NATURAL URANIUM MARKET IN ITS ESSENCE AND KEY PLAYERS

Natural uranium – is a raw material mined from the depths of the Earth, which goes through the primary stage of processing until it becomes a commercial product. The concentration of uranium in a rock varies. There are rocks in which the uranium content is high, and there are rocks in which the uranium content is low. The concentration of uranium content in the rock together with the methods of uranium mining form the basis of its production cost.

One thing that is constant about uranium is a chemical element: no matter where it is mined, the ratio of uranium isotopes in it will always be the same: 0.711 percent of uranium

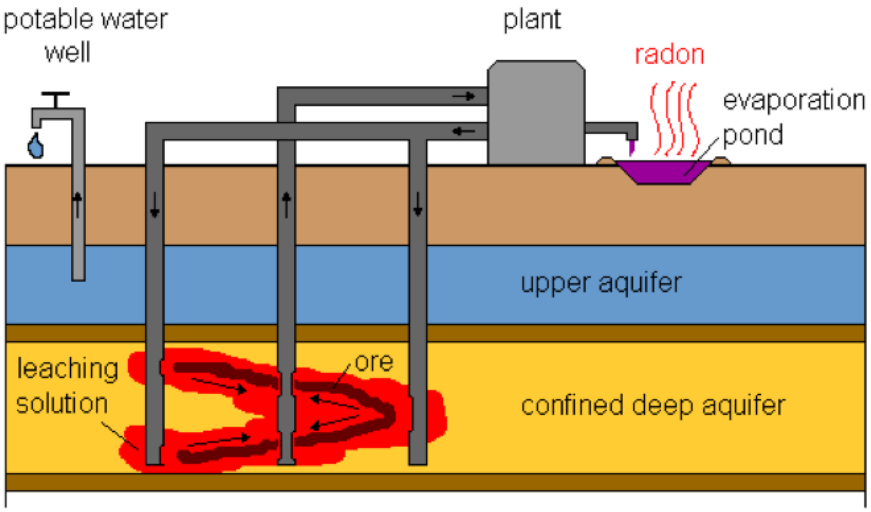
Nitrous oxide of uranium. Chemical formula: U3O8 *(yellowcake)*

Source: open data

235 isotope (U235) and 99.29 percent of uranium 238 isotope (U238). Since this is so, any product containing uranium, in which the content of U235 isotope is 0.711 percent is called *natural uranium*. Natural uranium sold on the market as a commercial product mainly is the uranium metal oxide with the chemical formula U3O8. The chemical name of this molecule is *uranium oxide*. This is dense and heavy powder. It looks like a bright yellow biscuit. Due to the external similarity of the commercial product to a confectionery product, uranium oxide was nicknamed *yellowcake*. To transport uranium oxide from the manufacturer to the buyer, standard transport containers in the form of two-hundred-liter metal barrels are used.

Ways of natural uranium mining

The first method of uranium mining is called the *in-situ leaching*. This method of uranium mining is used only where appropriate geological conditions allow. To extract uranium using



Scheme of normal ISL operation

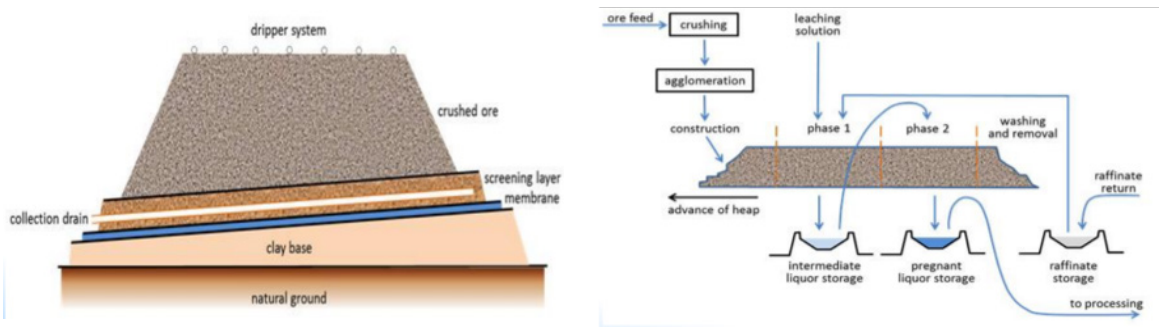
Source: https://www.wise-uranium.org/uisl.html

the in-situ leaching method, the structure of the rock containing uranium must have good water permeability. Sands and sandstones usually have these properties. In this regard, it is impossible to apply the in-situ leaching method everywhere. To mine uranium, regardless of the method of its extraction, sulfuric acid is always used. It sorbs the uranium contained in the rock. In order to extract uranium to the surface of the earth, injection and pumping wells are drilled. Sulfuric acid is supplied to injection wells and uranium concentrate is pumped out through pumping wells. After pumping out, the concentrate solution is evaporated, then heat treatment undergoes and finally purification. The result is uranium oxide. The in-situ leaching method is the most cost-effective method of uranium mining. The resulting commercial product has a cost of up to 40 dollars per 1 kg of uranium.

Where the rock does not have water permeability properties, the second method of uranium extraction is used – the *heap leaching* (*HL*) method. This method is much more expensive. If the depth of the rock layers containing uranium is small, then the open-pit mining method can be used. Today a significant amount of uranium in Australia is mined by open-pit mining. If the depth of the uranium ore layers is large, then this requires the construction of mines.

In addition to extracting rock with uranium, it is also necessary to build mining plants and rock crushing areas. Rock mined at depth rises through the mine to the surface of the earth. After sorting it at the mining and processing plant, the uranium-rich rock is sent to the grinding section. The crushed rock is poured into heaps, which are irrigated with sulfuric acid. Passing through the crushed rock, the acid sorbs uranium, after which the resulting concentrate is collected and then, as in the previous method, sent to the evaporation, heat treatment and purification section.

The resulting commercial product is obtained at a higher cost compared to that obtained by the in-situ leaching method. The cost of 1 kg of uranium mined by heap leaching is in the range of 60-80 dollars per 1 kg of uranium. The deeper the uranium stratum and the harder the rock in which it is contained than the higher cost of uranium. Many of the discovered deposits with proven reserves of uranium deposits have not yet been developed, since the cost of production at them exceeds market price quotes. When the level of economic feasibility is reached, such deposits begin to be developed. The by-products of uranium mining are gold and rare earth metals. Extracted by-products are always taken into account when calculating the economic efficiency of field development.



Heap Leaching

Source: https://nucleus.iaea.org/sites/orpnet/training/uranium/Shared%20Documents/Module%2016%20Case%20Studys%20Heap%20Leaching.pdf

Country	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Kazakhstan	22,451	23,127	23,607	24,689	23,321	21,705	22,808	19,477	21,819	21,227
Canada	9331	9124	13,325	14,039	13,116	7001	6938	3885	4693	7351
Namibia	4323	3255	2993	3654	4224	5525	5476	5413	5753	5613
Australia	6350	5001	5654	6315	5882	6517	6613	6203	4192	4553
Uzbekistan (est.)	2400	2400	2385	3325	3400	3450	3500	3500	3520	3300
Russia	3135	2990	3055	3004	2917	2904	2911	2846	2635	2508
Niger	4518	4057	4116	3479	3449	2911	2983	2991	2248	2020
China (est.)	1500	1500	1616	1616	1692	1885	1885	1885	1600	1700
India (est.)	385	285	385	385	421	423	308	400	600	600
South Africa (est.)	531	573	393	490	308	346	346	250	192	200
Ukraine	922	926	1200	808	707	790	800	744	455	100
USA	1792	1919	1256	1125	940	582	58	6	8	75
Pakistan (est.)	45	45	45	45	45	45	45	45	45	45
Brazil	192	55	40	44	0	0	0	15	29	43
Iran (est.)	0	0	38	0	40	71	71	71	21	20
Czech Republic	215	193	155	138	0	0	0	0	0	0
Romania	77	77	77	50	0	0	0	0	0	0
France	5	3	2	0	0	0	0	0	0	0
Germany	27	33	0	0	0	0	0	0	0	0
Malawi	1132	369	0	0	0	0	0	0	0	0
Total world	**59,331**	**56,041**	**60,304**	**63,207**	**60,514**	**54,154**	**54,742**	**47,731**	**47,808**	**49,355**
tonnes U_3O_8	69,966	66,087	71,113	74,357	71,361	63,861	64,554	56,287	56,377	58,201
% of world demand	91%	85%	98%	96%	93%	80%	81%	74%	76%	74%

Production from mines (tons U)

Source:https://world-nuclear.org/information-library/nuclear-fuel-cycle/mining-of-uranium/world-uranium-mining-production.aspx

The heap leaching method, in addition to the technical difficulties of obtaining a marketable product, has another significant drawback in comparison with the in-situ leaching method. After processing the rock and extracting uranium from it, a large number of wastes (heals) remains on the surface of the earth.

The World Nuclear Association publishes information in its annual reports on the volume of uranium mined in the world. The report contains the top list of countries (TOP 8) that has not changed over the years with Kazakhstan invariably holding the leadership position. According to the report for 2022, almost 49 thousand metric tons of uranium were mined in the world, which met three quarters of the needs of the global uranium market for raw materials[85]. The additional source of covering the need for natural uranium is a large number of accumulated waste dumps from uranium enrichment plants. They contain incompletely extracted uranium. Due to the increasing efficiency of uranium enrichment technologies, the reduction in quotations for natural uranium and the cost of

[85] Find more: World Uranium Mining Production // World Nuclear Association.

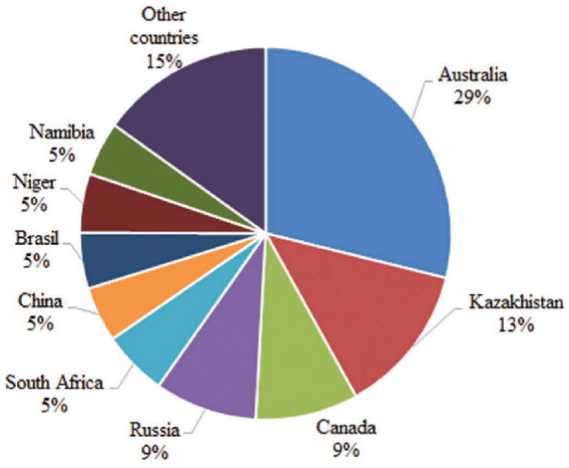
enrichment work over the course of ten years from 2007 to 2017, it has become profitable to use this secondary source of uranium in such volumes.

Nuclear power plants under the construction have a design life of 60-80 years. The operating experience of the already installed units indicates their high reliability and preservation of full functionality by the time the assigned resource expires. A large number of NPP units extend their operation for another 10-15 years after carrying out special works. Since uranium is a non-renewable fossil resource, it is important to understand the volume of natural reserves of uranium. How many years will uranium reserves last if the optimistic forecast of a doubling of the share of nuclear generation in the world by 2050 is realized? According to various sources, proven reserves of natural uranium range from 5.5 to 6.1 million tons. Another 2.2 million tons are contained in undiscovered deposits. This information allows experts to say with the confidence that at the current level of nuclear generation and the pace of its development, natural uranium reserves will last for another 100-120 years. Together with secondary sources of uranium, which must be taken into account together with the fact that not all reserves in the world have yet been explored and developed, natural uranium reserves will last for many generations to come. Conclusions about limited reserves of natural uranium do not relieve scientists of the task of ensuring the transition of the nuclear fuel cycle to a different operating scheme. One of the promising and practically proven types of nuclear generation of the future will be its transition to fast breeders. This type of generation has much greater prospects in terms of supply of raw materials, since it involves U238 isotope in operation and accumulated enormous reserves of plutonium. Also switching the energy sector to work in fast breeders will solve the problem of the nuclear legacy due to the possibility of burning minor actinides.

Australia has the largest reserves of natural uranium among all other countries in the world. It is followed by Kazakhstan, Canada and Russia.

▶ *Russia*. Russia is represented by the company *Atomredmetzoloto* JSC, or *ARMZ Uranium Holding Co* (ARMZ). The company's name in Russian indicates that its product line includes uranium, rare earth metals and gold. ARMZ is the uranium mining division of the Rosatom State Corporation. It includes three uranium mining companies:

- *Priargunsky Mining and Chemical Association* OJSC (city of Krasnokamensk, Chita region);
- *Khiagda* JSC (Republic of Buryatia);
- *Dalur* JSC (Kurgan region).



World uranium deposits (as of 2018)

Source:https://www.researchgate.net/figure/The-world-uranium-reserves-with-known-reserves-Turkeys-Mineral-Research-and-Exploration_fig10_332099832

At the enterprises in Khiagda and Dalur, uranium is mined using the in-situ leaching method. At the enterprise in the city of Krasnokamensk the heap leaching method is used. The data published by World Nuclear Association regarding uranium mined in Russia is the aggregate data on uranium production volumes from these three ARMZ's enterprises. According to the World Nuclear

Association report for 2022, the Russian company produced 2.500 tons of uranium, which is the sixth highest result in the world among countries. The mines of the enterprises are located in areas with proven reserves of natural uranium on a global scale.

Another Russian company that operates in the field of natural uranium mining is *Uranium One* (U1). Unlike ARMZ, which performs activities in Russia, U1 has mines exclusively outside Russia. Thanks to the effective corporate work of the management of U1 and its Russian parent company TENEX, which is one of the world leaders in the supply of uranium enrichment products and services with a share of 35 percent of the world market, the company has seven joint uranium mining ventures in Kazakhstan, as well as enterprises in Tanzania and Namibia. U1-related enterprises produced 4.500 tons of natural uranium in 2022, which accounted for 8 percent of the total global production of this type of raw material. U1 is working to develop deposits in Namibia, which will allow it to reach a new level in terms of natural uranium production after their development. Building such corporate connections within the structure of nuclear fuel cycle enterprises between raw materials companies and uranium enrichment companies is a good example of creating a sustainable supply chain, giving customers high confidence in the reliability of Russian suppliers of nuclear fuel cycle goods and services.

- *Kazakhstan*. The largest participant in the natural uranium market – the NAC *Kazatomprom* JSC. This is the national nuclear company of Kazakhstan. It is the world's largest producer of this type of raw material. *Kazatomprom* performs mining only in Kazakhstan and has a large base of uranium reserves. These reserves are estimated at 300 thousand tons. All of the company's uranium deposits are suitable for cost-effective mining using the in-situ leaching method. Combined with a long service life, these factors allow *Kazatomprom* to remain the world's leading producer of natural uranium at the lowest cost. The company has a widely developed network of foreign partners, including companies from Russia, Canada, Great Britain, China, France and Japan. There were 49 thousand tons of natural uranium mined in 2022 in the world. 21.2 tons were extracted from the mines in Kazakhstan. Kazakhstan supposed the construction of a NPP by 2014. Kazakhstan still does not have a nuclear power plant on its territory, so all mined uranium is exported. At the same time, *Kazatomprom* actively develops projects for the processing of natural uranium in order to expand its presence in the nuclear market with other types of products. The *Ulba Fuel Assembly* (UFA) joint venture is such a project. It was created by *Kazatomprom* with the Chinese company CGN. UFA has begun manufacturing fuel assemblies from uranium mined in Kazakhstan and enriched in Russia at the joint venture *Uranium Enrichment Centre* (shareholders – *Kazatomprom* and TENEX).

- *Canada*. Canada ranks second among the leading countries in terms of uranium production. The Canadian nuclear industry is represented by *Cameco* Corporation, which also operates in Australia, Kazakhstan, Switzerland, and the US. *Cameco* has all aspects of the nuclear fuel cycle, including uranium mining and fuel assembly manufacturing. The natural uranium mining division operates only in two countries – Canada itself and Kazakhstan. According to the World Nuclear Association report for 2022, *Cameco* produced 7.350 tons of natural uranium from Canadian mines alone, which amounted to 15 percent of the total global production. This figure allowed Canada to move from the third to the second position among the leading countries in terms of natural uranium production, leaving Namibia behind.

▶ *Australia*. Australia is the world leader in reserves of uranium, estimated at 30 percent of the global total – 661.000 tons. Despite the world's largest reserves of natural uranium, Australia ranks only the fourth in the list of uranium producing countries. Australia was the third until 2020, but in the last two years it has lost this position to Namibia. Australia produced 4.100 tons of natural uranium in 2022, accounting for 8 percent of the world's total production. All uranium mined in Australia is exported, since there are no nuclear power plants in the country. On the territory of the continental country, uranium mining began in 1954, and currently only three uranium mines are operating. Among the operating enterprises are the following ones:

- *Ranger Mine*, national company that has temporarily suspended uranium mining since 2021, but is waiting for its resumption in anticipation of the market recovery after its *drawdown*;
- *Olimpic Dam*, the largest Australian deposit, where the operator is a joint venture with the *BHP Billiton* (Great Britain);
- *Four Mile*, a joint venture with the American company *General Atomics*.

▶ *France*. France deserves some attention as a country that has not produced a single kg of uranium on its territory since 2016. At the same time, the assets of its national company *Orano* abroad made the French company second in the world in terms of natural uranium production. At the end of 2022, the assets in the *Orano* circuit accounted for 5.400 tons of natural uranium mined, which is the second result in the world among companies (not countries). Uranium mining enterprises in which *Orano* has an equity stake are located in Canada, Kazakhstan, Niger, and Uzbekistan. France is very interested in insuring itself with sources of raw uranium, since it is the leader in the production of energy from nuclear power plants in the world – 70 percent of the electricity produced in France is obtained using nuclear energy. Due to certain events in the global nuclear industry and in the national company *Areva*, following the accident at the Fukushima NPP in 2011, France is targeting a reduction in the share of nuclear energy in electricity production to 50 percent by 2025. However, in 2019, it suspended this decision until 2035, and, in February 2022, it announced a reversal of its strategy. A firm decision was announced to proceed with the construction of six new nuclear power plant units, as well as existing plans for the construction of eight more reactors.

▶ *Uzbekistan*. Uzbekistan is another uranium producing country that does not have a nuclear power plant on its territory yet but is included in the list of leading countries producing natural uranium. The share of world uranium production in Uzbekistan is 7 percent. The country produced 3.300 tons of product in 2022 and this is the fifth result among countries producing uranium raw materials. Like Australia, Canada, Kazakhstan and Niger, Uzbekistan exports the entire volume of natural uranium mined on its territory. Product buyers are the following ones: China, Japan, India, Korea, and the US. The only uranium mining enterprise operating in the country is the mining and metallurgical plant *Navoi Mining and Metallurgical Company* (NMMC) JSC in Navoi city. NMMC established a joint venture with the French company *Orano* in 2019. A very large *add-on* to the uranium product is the production of gold at the plant. According to open data, about 100 tons of *yellow metal* are mined in Uzbekistan per year. The presence of such a significant additive in the form of by-products at the Navoi' plant makes the production of uranium products very cost-effective and competitive. It should also be noted that Uzbekistan has now announced its intentions to build the first nuclear power plant on its territory.

▶ *China*. Today China constructs the largest number of nuclear power plant units in the world, and also has the most ambitious plans for the further development of nuclear generation. There are 55 reactors operating in the country with a total capacity of 53 GW, and construction of 25 units with a total capacity of 26.6 GW is underway. The rapid growth of the country's industry and economy, noted in recent decades, has required a serious increase in electricity production. Increasing the share of generation based on the use of fossil mineral resources, mainly coal, has caused large economic losses due to environmental pollution, estimated by the World Bank at 6 percent of China's GDP. Given the limited possibility of using renewable energy sources, China has set a course for the development of nuclear generation. The total electricity generation achieved in China today is 2011 GW, which is a quarter of the world's power. Against the backdrop of such significant figures for the consumption of electrical energy and the share of its production at NPPs, China has very modest indicators for the volume of natural uranium production on its territory, ranking eighth in the world among other countries. In the absence of natural reserves of natural uranium and the insufficient level of development of its own enrichment production, China is looking forward to importing natural uranium and enriched uranium product to meet its needs in full. One of the factors for insuring supply disruptions for countries like China is the creation of foreign assets with enterprises producing natural uranium, as well as enriched uranium products. Such countries also are the active buyers of nuclear fuel cycle products in order to create reserves.

Commercial aspects of natural uranium market

FOOD FOR THOUGHT

The main competitive factor of participants in the natural uranium market is the production cost of its extraction. The production cost depends on the method of natural uranium mining, the depth of the rock with uranium, the hardness and permeability of the rock, and the concentration of uranium in the rock. The production cost in the value of dollars per 1 kg of uranium extracted from the subsoil is the cheapest in Australia, Kazakhstan, Canada and Uzbekistan. It is a matter of fact that despite these favorable indicators, none of the listed countries still has not developed yet its own nuclear power generation. This a phenomenon of the nuclear industry indeed.

A sharp increase in prices on the natural uranium market, which remained virtually for a long period of time at the level of 15-18 dollars per 1 pound of uranium oxide (or 40-45 dollars per 1 kg of uranium), began in 2004 and continued until 2007. This time was called *nuclear renaissance*. The price race arose in connection with the big plans of many countries in the transition to nuclear generation. Due to the fact that these plans were received with restraint by natural uranium producers, a situation of predicted shortage of raw materials first arose, which led to an increase in prices. Also, traders played a big role in the *overheating* of the market. They began to buy natural uranium for storage with the hope of its subsequent resale at higher prices. Prices that soared in 2007 to 120 dollars per pound of uranium oxide (350 dollars per 1 kg of uranium) froze at this level and then plummeted down. The onset of the nuclear renaissance proceeded at a different pace, the market experienced a surplus of raw materials, and traders' warehouses became overfilled. Such races always cause *overheating* of the market. In such a situation, a price collapse is inevitable.

Spot and long-term uranium prices (2000-2022)

Source:https://world-nuclear.org/information-library/nuclear-fuel-cycle/uranium-resources/uranium-markets.aspx

The rate of decline in prices, which began in 2007, was about 30 percent for three years, until in 2010 they reached equilibrium at around 40 dollars per 1 pound of uranium oxide (104 dollars per 1 kg) and began to grow again, reaching March 11, 2011, marks 75 dollars per 1 pound of nitrous oxide (182 dollars per 1 kg). On this day, the accident at the Fukushima NPP occurred, which brought the entire global nuclear industry into a state of decline for a decade. In recent years, there has been a recovery in the nuclear industry. Many skeptical countries changed their views on nuclear energy after the events in Fukushima. They are making more and more choices in its favor now. Of course, the fact that the world has not achieved the desired level of energy production from renewable sources also played a role in the rise of the nuclear industry.

However, a number of other events, primarily of a political nature, are forcing countries to return to previously stopped areas of work to create insurance sources for their raw material supply with natural uranium. As an example, in 2021, the United States launched the program to create a strategic reserve in the face of risks of reduced supplies from Russia. The program of the local uranium producers support is estimated at 75 million dollars and is aimed at purchasing up to 800 thousand pounds (363 thousand tons) of uranium oxide from them at a fixed price range. The US Department of Energy also plans to invest 14 dollars million in the *ConverDynLkz* uranium conversion facility to reprocess natural uranium to the form of uranium hexafluoride (UF6). The size of this stock is insignificant. To understand the scale of this project, it should be noted that in 2021 the US nuclear power plants purchased 46.7 million pounds of uranium oxide at an average price of 33.9 dollars per pound (worth 1.5 billion dollars).

ENRICHED URANIUM MARKET

Before natural uranium becomes nuclear fuel, it goes through several stages of reprocessing. All stages, including uranium mining, are called *nuclear fuel cycle*. There is a sensitive part of the nuclear fuel cycle from a nuclear proliferation perspective called uranium en-

richment. This stage of redistribution of natural uranium is necessary in order to change the natural ratio of the isotopes U235 and U238 contained in the element *uranium*, raising the content of U235 to the level of 3-5 percent. From this point, fuel assemblies containing higher enrichment than natural uranium launch neutron decay in the reactor, causing a controlled chain reaction of uranium fission. This releases a large amount of thermal energy. Possession of uranium enrichment technology makes it possible to produce uranium of various degrees of enrichment, up to high levels that can become a component of the charge of an atomic bomb. This is the essence of the sensitivity of the uranium enrichment stage.

Uranium is enriched using specialized equipment, which gives the name to uranium enrichment methods: gaseous diffusion machines and centrifuge technology. There are other ways to enrich uranium, but they are not on an industrial scale and are not economically efficient.

▶ *Gaseous diffusion machines*

Uranium undergoes an enrichment stage in the gas phase. Since uranium was originally a metal, it was necessary to come up with a compound of uranium in which its state of aggregation would be gas, and the chemical element itself would retain its physical and chemical properties. Such chemical element that made it possible to convert uranium metal into a gas state and remain neutral in relation to it was found. This element is fluorine. Production facilities where uranium is combined with fluorine are called conversion plants. They produce a commercial product UF6, which is sent to uranium enrichment plants for enrichment.

The first uranium enrichment machines were gaseous diffusion machines. They took up a lot of space in production workshops and were very intensive in terms of energy. Their productivity in comparison with centrifugal uranium enrichment technology differs tenfold. Energy consumption differs by the same amount. However, in the era of the emergence of the global nuclear industry, which at the very beginning had an exclusively military purpose, it was necessary to obtain enriched uranium at any cost. This task was successfully completed. Due to the low separation ability of gaseous diffusion machines, uranium dumps after enrichment continued to contain enough U235 isotope in depleted uranium. Scientists and engineers of that time understood that enrichment technologies would develop, and the time would come when re-extracting U235 from dumps would become feasible and cost-effective.

▶ *Centrifuge technology*

This time has come with the creation of centrifuge technology. Today obtaining enriched uranium would be economically ineffective without it. Each country has chosen its own path for the development of this area, while information about the design and features of centrifuges is strictly classified. The performance of gas centrifuges depends on two parameters – the height of its rotor and its rotation speed. Russian technology, having reached certain stages of improving its equipment, then follows the path of extensively increasing uranium enrichment capacity, installing the number of gas centrifuges in production that is required. As technology improves, centrifuges can be replaced for modern ones increasing the productivity of enterprises. Russian gas centrifuges are distinguished

by the highest reliability. Their non-stop service life is about 30 years. At the same time, they can withstand high-magnitude earthquakes. If something happens to any individual centrifuge, then the losses from its failure are insignificant. Failed equipment is automatically switched off and can be replaced with a serviceable one during repairs.

The US initially chose the expensive method of uranium enrichment using the gaseous diffusion machines. They learned about Soviet centrifuge enrichment technology only after the USSR collapsed in 1991. When they got an opportunity to visit the Soviet enrichment plant, at first, they did not believe that this was a real working technology. The technology itself, of course, was known, but the design on which all this was done was unknown to anyone except Soviet scientists. Therefore, American specialists even measured Soviet equipment with their ties in order to study it. Why all these technologies remained classified and did not flow over to Western intelligence services in the 1990's it is a big question. The United States tried to create something similar but failed. Centrus company (formerly USEC) which tried to build the first American uranium enrichment plant using centrifuges in February 2016 closed this project. The Americans took the path of creating a centrifuge with a rotor height of several meters. It is considered good manners not to criticize colleagues in the industry. However, it is obvious that this centrifuge design has a number of significant disadvantages. First of all, this is the loss of separation capacity in the event of breakdowns. The United States is completely dependent on imports of natural uranium today: according to the US Energy Information Agency, its own deposits satisfy only 11 percent of the nuclear industry's current needs for raw materials. In addition to the problems of raw material supply, there is not enough enrichment capacity. Therefore, the United States is very dependent on nuclear fuel supplied from Russia. European countries also enrich uranium, but in smaller quantities than in Russia, and those countries need nuclear fuel themselves.

The evolution of the development of gaseous diffusion technology in the USSR and then in Russia was of success. With multiple increases in equipment productivity, energy consumption remains unchanged. This is the main component of the cost of producing enriched uranium which form prices on the second uranium market. This is the market for enriched uranium. Enriched uranium, having gone through several stages of reprocessing, includes all the costs of reprocessing. Accordingly, the price of enriched uranium includes a component of the cost of natural raw materials, its conversion into UF6 and the enrichment itself. Enriched uranium product is a specific product. Its consumers primarily are nuclear fuel production plants – fuel fabricators. Each fuel assembly contains uranium pellets made from enriched uranium of varying degrees of enrichment. Assemblies for each specific nuclear power plant unit are individual and differ in the degree of enrichment.

How to calculate the cost of an enriched uranium product?

For the convenience of calculating the cost of an enriched uranium product, separate work unit (SWU) was introduced. This unit was proposed by the American Atomic Energy Commission in order to establish uniformity in calculations for uranium enrichment work. The meaning of this unit of account is as follows. To produce a substance with a certain isotopic composition from the starting components, you need to spend the same number of units of separation work, regardless of what separation capacity your equipment is.

The number of units of separation work spent depends only on the content of U235 in the feedstock, what degree of enrichment needs to be achieved in the end, and what degree of enrichment for U235 the dump should have. For ease of understanding it looks like this. To produce 1 kg of uranium enriched in U235 with an enrichment of 5 percent from natural raw materials with an enrichment of 0.711 percent, 10.4 kg of raw uranium and 7.9 units of separation work are required. In this case, 0.25 percent of unrecovered uranium will remain in the dump. If we increase the degree of uranium extraction from raw materials by sending 0.2 percent enriched uranium to the dump, this can be achieved by increasing the number of separation work units to 8.9 SWU while simultaneously reducing the consumption of raw materials to 9.4 kg. In this regard, the producer of enriched uranium always has a choice, what is better to do – spend more raw materials or SWU.

The market for enriched uranium products is enormous in terms of the value of the goods traded on it, but very small in terms of the number of participants. In monetary terms, it is estimated at 5 billion dollars. Objectively, all participants in this market are nuclear-weapon states according to the definition of the Nuclear Nonproliferation Treaty (NPT). And this is no coincidence. The development of nuclear energy arose from the military programs and was based on technologies for creating nuclear weapons.

Uranium enrichment capacity

According to the World Nuclear Association report of 2022, the current volume of installed uranium enrichment capacity in the world is 60 million SWU, with a demand of 50 million[86]. These figures indicate that the surplus of installed capacity allows enrichment plants to operate with the deeper extraction of uranium from natural raw materials, while consuming more SWU. Otherwise, they can use not natural uranium as a raw material source, but dumps (depleted uranium) from previous years with a high content of U235. That is what happening in practice today. Russia has the largest uranium enrichment capacity, approximately half of all capacity in the world. It is followed by the British-German-Dutch concern URENCO, then France, China and the USA. A number of states classified by the World Nuclear Association as *other* also have uranium enrichment capabilities. Among them are Argentina, Brazil, India, Iran, and Pakistan. The total installed production capacity in these countries is estimated at

Country	Company and plant	2020 capacity (thousand SWU/yr)
France	Areva, Georges Besse I & II	7500
Germany-Netherlands-UK	Urenco: Gronau, Germany; Almelo, Netherlands; Capenhurst, UK.	13,700
USA	Urenco, New Mexico	4900
Russia	Tenex: Angarsk, Novouralsk, Zelenogorsk, Seversk	27,700
China	CNNC, Hanzhun & Lanzhou	6300
Other	Various: Argentina, Brazil, India, Pakistan, Iran	66
	Total SWU/yr approx	**60,166**
	Requirements (*WNA reference scenario*)	50,205

World enrichment capacity – operational and planned

Source:https://world-nuclear.org/information-library/nuclear-fuel-cycle/conversion-enrichment-and-fabrication/uranium-enrichment.aspx

[86] Find more: Uranium Enrichment // World Nuclear Association.

66 thousand SWU, while the World Nuclear Association report, for obvious reasons, does not disclose the purpose of the products obtained there.

Issues if export control

The circulation of nuclear materials on the market, export-import operations with them, transactions between participants in the form of contracts, is regulated by rules and procedures called *export control*. The establishment of control measures over the use of nuclear materials, technologies and equipment has been the basis for the safe operation of the global nuclear energy industry. The International Atomic Energy Agency (IAEA) is the main international body for monitoring the preservation of the global nuclear non-proliferation regime and the use of nuclear materials in exclusively peaceful purposes. Non-nuclear-weapon states have concluded agreements with the Agency to place all their activities in the field of atomic energy under the control of the Agency. The IAEA applies its control functions and forms annual conclusions on the peaceful orientation of the activities of each state in the nuclear field. Within the framework of concluded protocols to agreements with the IAEA, nuclear-weapon states inform the Agency about transactions with non-nuclear-weapon states. According to the Russian legislation, any operations in the nuclear field are possible only with obtaining licenses from a special supervisory authority and obtaining assurances from the government body of the recipient country regarding the peaceful use of the goods, services, technologies and equipment.

Transport containers for enriched uranium are much more serious devices compared to those used for natural uranium. They have thick walls because they are pressurized. Containers with enriched uranium can withstand contact with open fire and retain their integrity when dropped from vehicles. To transport containers different types of vehicles, rail and sea vessels are used. Carriers of nuclear materials must have appropriate licenses for transporting nuclear materials, as well as trained and certified personnel. The nuclear material during transportation is a subject to mandatory insurance against risks that may arise as a result of a nuclear incident. Each batch of material sold on the market is subject to mandatory certification and storage of control samples until the quality of the material is checked by the customer.

Price changes

Price changes for SWU practically repeat the situation with price changes in the natural uranium market. However, it does not have such serious deviations from the minimum and maximum values as it was in case with prices for natural uranium. The reason for this is that enriched uranium is never purchases in reserve. The production of enriched uranium product is carried out with a given degree of enrichment for each nuclear power plant unit. The specific degree of enrichment depends on the actual operating conditions of the nuclear power plant unit from one refueling to another. In this regard, it is not possible to accurately calculate the degree of uranium enrichment for the future. That is why the enriched uranium market did not experience the *overheating* that happened to the natural uranium market. Currently, there is also an increase in prices on the market, and this increase is sustainable. The average market price in 2022 was about 85 dollars per 1 SWU. The market recently saw a spot trade occur at 160 dollars per SWU. However, if the volume of this transaction is insignificant and there are no other transactions at prices at this level, it should not be considered as a trend.

Spot Ux SWU price

Source: https://www.uxc.com/

PITFALLS IN NUCLEAR COOPERATION

Cooperation in any area implies the fulfillment of contractual obligations assumed. Parties must resolve disputes in a civilized manner defending their interests in courts in case of their violation. Violation of established norms of cooperation and transfer of the situation into an illegal field inevitably leads to the loss of business reputation of those who allow themselves to do so. In recent years, several events have been observed on the global uranium market, which in the future may work against those who allowed such actions in their work.

▶ On October 22, 2006, emergency mine flooding occurred at the Cigar Lake mine of the Canadian company *Cameco*. Water began flowing at a rate of 1.500 cubic meters per hour. The engineers were unable to cope with this problem, as a result of which the mine was completely flooded within 24 hours. The global uranium market suffered a serious shock, as the accident removed a significant amount of natural uranium and created a shortage of raw materials. It should be noted that the uranium produced at the mine had a fairly low production cost and ensured a stable price level on the market. Subsequent proceedings revealed a gross violation of the rules for conducting exploration work by the operating organization, it was the cause of this incident.

▶ In May 2016, a situation arose when the Ukrainian side unilaterally violated the terms of a long-term fuel contract with the Russian company TVEL. Until 2016 the entire fleet of Ukrainian NPPs was supplied with Russian-made fuel. In violation of the terms of the contract the Ukrainian side transferred part of the fuel purchases for the needs of its nuclear power plants to the American company *Westinghouse*. As a compromise, an agreement was signed between the parties in 2018, guaranteeing to the Russian side 60 percent of the fuel market for Ukrainian NPPs until 2025. However, cooperation between states has now completely ceased. Of course, this situation affected market prices.

▶ Announcements declaring bankruptcy of major nuclear market participants cause severe price shocks. When the world leader in the field of nuclear energy, the American-Japanese company *Westinghouse Electric*, declared itself bankrupt in 2017, it influenced the market price quotes. Before this event, the company tried to solve some of its problems based on the contradictions between Ukraine and Russia. It began to arrange supplies of its uncertified nuclear fuel to Ukraine for Russian-design reactors, even despite the threat of a nuclear incident. Nowhere in the world it is allowed to use *foreign* fuel without mandatory research and testing by the developer of the nuclear power plant unit. Based on the test results, the fuel must be certified and receive permission for use from the general designer of the nuclear power plant. According to experts, *Westinghouse Electric* bankruptcy was caused by a loss of competencies. By that time, the United States had not built a single nuclear power plant for a decade.

▶ 2018 was the last year of the French company *Areva* existence. The company showed an operating loss of 8 billion euros. There is evidence that this figure was much higher. According to many experts, the company fell into a trap that it built for itself. The meaning of the failure was the rash actions of the company's management, which relied on the rapid growth of the global nuclear industry at the beginning of the 21st century. Due to the incident at the Fukushima NPP and the sharp change in the situation in the nuclear field, huge investments in the development of *Areva* Group enterprises in order to increase production volumes were not justified, and the funds were not returned. In this regard, the French government made the most correct decision to create a *twin* of *Areva*, the company *Orano*, relieving it of the debt burden of its predecessor. Part of the new company's profits goes to cover losses through revenues to the state. The state, in its turn, is engaged for restructuring the debt of the debtor company.

▶ Reputation and competence are the key issues that provide any company for sustainable business development. Sometimes the most successful companies also fail. An example of such a failure can be considered the situation with the delay in the launch of the first nuclear power plant in the UAE – Barakah NPP. The delay in launching the first unit was 55 months. Instead of the planned 2017, the NPP launched the first unit only in 2021. The reputation of the developer, the Korean company *Korea Hydro and Nuclear Power* (*KHNP*), was at stake, for which this was the first experience of constructing nuclear power plant abroad. Whether this will affect the future of the Korean company's work in the market is a matter of time. And it is still very difficult to give an exact answer today on this point.

▶ Measures to restrict trade in nuclear technologies, materials and equipment, consisting in the introduction of sanctions, restrictions, quotas in relation to individual states, are nothing more than methods of dirty competition. It is a fact that those countries who impose such restrictions often suffer from such methods themselves. When the situation reaches the point of absurdity, double standards are activated. Of course, such situations should be completely excluded in the civilized world. Competition must be healthy, based on advanced technologies and economic efficiency. For example, the United States introduced quotas on nuclear fuel cycle goods supplied from Russia, setting a maximum level for their import into the United States in a volume not exceeding 20 percent of the need for them. The reason for this ban was the conclusion of the Americans that in order to conquer the market, the Soviets were deliberately dumping and selling products at a loss. It was not true, and it was a pure example of deterrence. At the same time, when the Unit-

ed States-Russia Highly Enriched Uranium Purchase Agreement (HEU-LEU Agreement, or *Megatons to Megawatts* Program) was concluded between Russia and the United States in 1993, and Russian nuclear warheads were converted into energy-grade uranium for the US market, a suspended agreement was signed, quotas on Russian products were temporarily canceled to encourage Russia to disarm.

▶ Russian experience of cooperation with so many states in the nuclear field gives a number of reasons to believe that in order to eliminate Rosatom State Corporation from the market, methods of unfair competition from third states were used. So, in 2017, against the background of the already signed agreement on cooperation in the field of peaceful uses of nuclear energy with South Africa, which envisaged the construction of up to eight nuclear power plant units in the country with a total capacity of 9.6 GW, an unexpected break of the agreements occurred. On April 26, 2017, the highest court of the Western Province of South Africa abolished the agreement with Russia, based on the arguments of *green* environmentalists. It was obvious that large political forces were behind this, and not a simple group of environmentalists in the country. As a result, the deal with Russia and a number of other corporations from other countries, estimated at 76 million dollars, was terminated. The South African president was subsequently dismissed. He was charged with lobbying for the country's nuclear energy development project.

▶ A similar story with Rosatom State Corporation happened in Vietnam a few months earlier. An unexpected, sharp change in course towards cooperation with Russia was also against the background of the concluded agreement on the construction of a nuclear power plant of the Russian design in Vietnam. According to the terms of the agreement in Vietnam, it was planned to begin construction of two VVR-1200 type reactors at the Ninh Thuan-1 site in 2014 and put them into operation in 2020. A similar agreement was concluded between Vietnam and Japan. The Japanese side was assigned the role of the constructor for the Ninh Thuan-2 NPP with its launch into operation in 2024-2025. On November 22, 2016, the Vietnamese National Assembly completely stopped the country's nuclear energy project.

Of course, Rosatom State Corporation drew certain conclusions from these situations happened in South Africa and Vietnam. The current level of the portfolio of foreign orders suggests that the conclusions were made correctly. Despite all the difficulties and restrictions, the company is developing steadily, maintaining its position on the market.

LIST OF ABBREVIATIONS

ABM Treaty – Anti-Ballistic Missile Treaty

AG – Australia Group

AGCR – Advanced Gas Cooled Reactor

AI – Artificial Intelligence

ASEAN – Association of South-East Asian Nations

AUKUS – Acronym for Australia, the United Kingdom, and the United States

AVLIS – Atomic Vapor Laser Isotope Separation

BATNA – Best Alternative to Negotiated Agreement

BCC – Bilateral Consultative Commission

BTWC – Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction

BWR – Boiling Water Reactor

CANWFZ – Central Asian Nuclear-Weapon-Free Zone

CBM – Confidence-Building Measure

CD – Conference of Disarmament

CERT – Computer Emergency Response Team

CFE Treaty – 1990 Conventional Forces in Europe Treaty

CIA – Central Intelligence Agency

CIS – Commonwealth of Independent States

CNS – 1994 Convention on Nuclear Safety

CoCom – Coordinating Committee for Multilateral Export Controls

CPPNM – 1979 Convention on the Physical Protection of Nuclear Material

CSC – 1997 Convention on Supplementary Compensation for Nuclear Damage

CTBT – 1996 Comprehensive Nuclear-Test-Ban Treaty

CTR – Cooperative Threat Reduction Program, or *Nunn-Lugar Program*

CVID – Complete, Verified and Irreversible Dismantlement

CWC – Chemical Weapons Convention

DNC – Democratic National Committee

DPRK – Democratic People's Republic of Korea

ENCD – Eighteen Nation Committee on Disarmament

ENMOD – 1977 Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques

EW – Exempt waste

E3 – European three states – France, Germany, and Great Britain, which were participants of the negotiations with the Iran on Iranian nuclear deal

FMCT – Fissile Material Cutoff Treaty

FNR – Fast Neutron Reactor

GCC – Gulf Cooperation Council

GGE – Group of Governmental Expert

HEU-LEU Agreement – 1993 United States-Russia Highly Enriched Uranium Purchase Agreement, or *Megatons to Megawatts* Program

HL – Heap Leaching

HLW – High-Level Waste

HTGR – High Temperature Gas Cooled Reactor

IAEA – International Atomic Energy Agency

ICBM – Intercontinental Ballistic Missile

ICTs – Information and Communication Technologies

IDC – International Data Centre

ILW – Intermediate Level Waste

IMS – International Monitoring System

INARA Act - Iran Nuclear Agreement Review Act

INF Treaty – 1987 Intermediate-Range Nuclear Forces Treaty

ISIS – Islamic State of Iraq and Syria[87]

ISL – In Situ Leaching

ISR – In Situ Recovery

JCPOA – Joint Comprehensive Plan of Action

JINR – Joint Institute for Nuclear Research

JPA – Joint Plan of Action

LLW – Low Level Waste

LTBT – 1963 Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water, or Limited Nuclear Test Ban Treaty

LWR – Light Water Reactor

MAD – Mutual Assured Destruction

MBFR – Mutual and Balanced Force Reductions

MDM – Multilateral Disarmament Machinery

MENWFZ – Middle East Zone Free of Nuclear Weapons and Other Weapons of Mass Destruction

MIRV – Multiple Independently Targetable Reentry Vehicle

MLF – Multilateral Forces

MLIS – Molecular Laser Isotope Separation

MOX – Mixture of Uranium and Plutonium Oxides

MTCR – Missile Technology Control Regime

NATO – North Atlantic Treaty Organization

NCG – Nuclear Consultative Group

NC3I – National Command, Control, Communication and Intelligence Center

New START – 2010 Treaty between The United States of America and the Russian Federation on Measures for the Further Reduction and Limitation of Strategic Offensive Arms

NPP – Nuclear Power Plant

NPT – Treaty on Non-Proliferation of Nuclear Weapons, or Nuclear Nonproliferation Treaty

NSG – Nuclear Suppliers Group

Nuclear Five (or P5) – Five nuclear-weapon states recognized by the 1968 Treaty on Non-Proliferation of Nuclear Weapons, namely China, France, Great Britain, USA, USSR/Russia, which are also the permanent five member states of the UN Security Council

NWFZ – Nuclear-Weapon-Free Zone

OPANAL – Agency for the Prohibition of Nuclear Weapons in Latin America

OST – 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, or Outer Space Treaty

PHWR – Pressurized Heavy Water Reactor

PIF – Pacific Islands Forum

PPCM – Perimeter and Portal Continuous Monitoring

PrepCom – Preparatory Committee for Review Conference of Parties to Treaty on Non-Proliferation of Nuclear Weapons

PTBT – 1963 Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water, or Partial Test Ban Treaty

PUREX – Plutonium-Uranium Extraction

PWR – Pressurized Water Reactor

RDD – Radioactive Dispersion Device

RED – Radiation Exposure Devices

RevCon – Review Conference of Parties to Treaty on Non-Proliferation of Nuclear Weapons

RBMK – Channel Type Graphite Moderated Boiling Water Reactor

ROK – Republic of Korea

RTG (or RITEG) – Radioisotope Thermoelectric Generators

RW – Radioactive Waste

SALT I – 1972 Strategic Arms Limitations Talks Treaty I

SALT II – 1979 Strategic Arms Limitations Talks Treaty II

SDGs – Sustainable Development Goals

SEANWFZ – Treaty on the Southeast Asia Nuclear Weapon-Free Zone, or Treaty of Bangkok

SILEX – Separation of Isotopes by Laser Excitation

SLBM – Submarine-Launched Ballistic Missile

SLCM – Sea-Launch Cruise Missile

SMR – Small Modular Reactor

SOA – Strategic Offensive Arms

SORT – Treaty Between the United States of America and the Russian Federation on Strategic Offensive Reductions, or Treaty of Moscow

SSOD – 1978 United Nations Special Session on Disarmament

(or the 10th UN Special Session of the General Assembly)

START I – 1991 Strategic Arms Reduction Treaty I

START II – 1993 Strategic Arms Reduction Treaty II

SVR – Foreign Intelligence Service of Russia

SWU – Separate Work Unit

TNCD – Ten Nation Committee on Disarmament

TPNW – 2017 Treaty on the Prohibition of Nuclear Weapons

TRISO – Tristructural-Isotropic Particles

UAV – Unmanned Aerial Vehicle

UK – United Kingdom

UN – United Nations

UNAEC – United Nations Atomic Energy Commission

UN GA – United Nations General Assembly

UNIDIR – United Nations Institute for Disarmament Research

UN SC – United Nations Security Council

UOC – Uranium Ore Concentrate

UREX – Uranium Extraction

US/USA – United States of America

USSR – Union of Soviet Socialist Republics, or Soviet Union

U235 – Uranium 235 Isotope

U238 – Uranium 238 Isotope

VLLW – Very Low-Level Waste

VSLW – Very Short-Lived Waste

WA – Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies

WMD – Weapon of Mass Destruction

WWI – World War I (1914-1918)

WWII – World War II (1939-1945)

ZAC – Zangger Committee

ZNPP – Zaporozhye Nuclear Power Plant

ZOPFAN – Zone of Peace, Freedom and Neutrality Declaration

ABOUT THE AUTHORS

AMBASSADOR ANATOLY ANTONOV

Doctor of Political Science. In 1978, graduated from MGIMO and joined the Ministry of Foreign Affairs of the USSR. Held various positions within the Ministry and its foreign missions. In 2002-2004, he was Ambassador-at-Large of the Russian Foreign Ministry. In 2004-2011, he was Director of the Department of Security and Disarmament of the Ministry. In 2011-2016, he was Deputy Minister of Defense of the Russian Federation. In 2016-2017, he was Deputy Foreign Minister of the Russian Federation responsible for general issues of military and political security. On August 21, 2017, Vladimir Putin issued an Executive Order appointing Anatoly Antonov Ambassador Extraordinary and Plenipotentiary of the Russian Federation to the United States of America and, concurrently, Permanent Observer of the Russian Federation to the Organization of American States in Washington, D.C. Holds a diplomatic rank of Ambassador Extraordinary and Plenipotentiary, assigned in July 2007. Decorated with the Order *For Merit to the Fatherland* of the 4th class, the Order of Alexander Nevsky, the Order of Honor (twice), the Order *For Military Merit*, the Order of Friendship, as well as a number of medals.

DR. ELENA CHERNENKO

PhD in History. In journalism since 2003. She worked as a correspondent for several news outlets, since 2010 at the *Kommersant* daily newspaper in the position of a Special Correspondent. Her professional interests include cyber diplomacy, arms control and nonproliferation. Member of PIR Center Executive Board, Co-Chair of the *Trialogue* Club International, Member of the Board of the Council on Foreign and Defense Policy (SVOP).

GLEB EFREMOV

Graduated from the Bauman Moscow State Technical University. In 2002-2006, he was a specialist in the Project Management Department, the Head of the Investment Management Department of Techsnabexport. In 2006-2007, he was the Head of the Department, the Director of the Economic Department for the Production of Gas Centrifuges, Adviser to the Director of the SNF Department in Techsnabexport. In 2007-2009, he was Advisor to the Deputy General Director, Advisor to the Director of the Pricing Department of the Financial Directorate of Techsnabexport. In 2009-2016, he was the Commercial Director of the International Uranium Enrichment Centre. Since 2016 he has been the General Director of the International Uranium Enrichment Centre (Russia). Member of PIR Center Advisory Board.

DR. IGOR ISTOMIN

PhD in Political Science. He is an Acting Chair of the Department of Applied International Analysis at MGIMO University. He is also an Executive Editor of *Mezhdunarodnye protsessy* (*International Trends*), the leading Russian academic journal on international relations theory. He is specialized in Russian-Western relations, US foreign policy, European security and alliance politics. He also teaches international relations theory and methods of applied foreign policy analysis. Author of more than 90 academic publications in Russian and English. Member of PIR Center Advisory Board.

ELENA KARNAUKHOVA

In January of 2021, joined PIR Center as an Assistant to Director on Special Projects-Education and Training Program Coordinator. Since July 2022 she has been a Deputy Director-Education and Training Program Director at PIR Center. Within the 10th NPT Review Conference coordinated the work of PIR Center team representatives, who participated in the forum given PIR Center consultative status with ECOSOC. Was one of the editors of PIR Center *Security Index* Occasional Paper Series *The Tenth NPT Review Conference (2022): Chronicle of the Failure Foretold.* Also holds the positions of Executive Secretary of the *Trialogue* Club International, Executive Secretary of PIR Center International School on Global Security, Executive Secretary of PIR Center Advisory Board. Graduated from the School of World Politics of Lomonosov Moscow State University with honours degrees in International Relations with major in International Security. In 2023, finished PhD courses of the School of World Politics at Lomonosov Moscow State University.

VLADIMIR KUCHINOV

In 1969, he graduated from the Moscow Engineering Physics Institute (MEPhI) as an engineer-physicist. From 1975 to 1991 he was a Research Assistant, Head of the Department, Deputy Head of the International Relations Department of the State Atomic Energy Committee, Ministry of Atomic Energy and Industry of the USSR. In 1991-1994 – Advisor to the Permanent Mission of the Russian Federation to the International Organizations in Vienna. Employee of the IAEA in 1980-1985 and in 1994-1998. In 1998-2002, he was Deputy Head, and since 2002 – Head of the Department, Ministry of Atomic Energy of the Russian Federation for International and Foreign Economic Cooperation. From 2004 to 2008 he was the Head of the Department of International Cooperation of the Federal Atomic Energy Agency of the Russian Federation. From 2008 to 2018 he served as an Advisor to the Director General of Rosatom State Corporation. From 2018 to the present, Associate Professor of the Department of International Relations, Institute of International Relations of the National Research Nuclear University *MEPhI*. Member of PIR Center Advisory Board.

DR. MIKHAIL LYSENKO

PhD in Law. In 1977, he graduated with honors from MGIMO. In 1977-2008, served at the Foreign Ministry of the USSR/Russia. In 2000-2004, he was Director of the Department for Security and Disarmament of the Russian Foreign Ministry. In 2004-2008, served as Ambassador of the Russian Federation to New Zealand. In 2008-2015, worked as Director of the Department of International Cooperation of Rosatom State Corporation. Since 2016 – Deputy Director of International Law Department at MGIMO University. Participated in talks on Russian-USA strategic arms reduction treaties, Comprehensive Nuclear-Test-Ban Treaty, etc. Headed Russian delegations in negotiations on more than ten intergovernmental agreements on peaceful use of atomic energy. Author of more than 50 scientific publications. Member of PIR Center Advisory Board.

DR. ANDREY MALOV

PhD in Political Science. Graduated from Maurice Thorez Moscow State Institute of Foreign Languages. Worked at the Committee of the Soviet Youth Organizations responsible for emerging leaders programs. In 1991-1994, he was a researcher and lecturer at the Institute for Economic Strategies at the Russian Academy of Sciences. In 1991, he was a Visiting Professor in Western International University, Arizona, USA. From 1993 to 2018 he served at the Russian Foreign Ministry. Seconded in the OSCE missions in Nagorno-Karabakh (1994-1996) and Bosnia and Herzegovina (1996-1998). Worked on arms control, nonproliferation and disarmament issues at the Russian Foreign Ministry since 1998. For example, he held the position of the Head of Multilateral Disarmament Division. He participated in the negotiations on multilateral disarmament as on official member of the Russian delegations. Headed the Russian delegations on lethal autonomous weapon systems issues within the Group of Governmental Experts (unofficial and official formats) in the framework of the United Nations Convention on Certain Conventional Weapons (CCW) (2013-2018). Member of PIR Center Advisory Board.

ADLAN MARGOEV

Research Fellow at the Center for Middle East Studies at the Institute for International Studies of MGIMO University. Lecturer at the Department of Asia and Africa Studies at MGIMO University. In 2019-2022, he was Chief Strategy Officer at the same Institute. In 2017-2019, he directed *Nuclear Nonproliferation* and *Russia* Program at PIR Center. Graduated from the Dual Degree MA Program *Global Security, Nuclear Policy, and WMD Nonproliferation* launched by MGIMO, PIR Center, and the Middlebury Institute of International Studies (MIIS) at Monterey, USA. Member of PIR Alumni Community.

DR. VLADIMIR ORLOV

PhD in Political Science. Founder and Director of PIR Center, member of its Executive Board. Director of PIR Center's *Nuclear Nonproliferation and Russia* Program. Founder (1993) and President of the *Trialogue* Club International. Professor at MGIMO University, Academic Advisor of the Dual Degree MA Program *Global Security, Nuclear Policy, and WMD Nonproliferation* (developed by MGIMO University, PIR Center and Middlebury Institute of International Studies at Monterey, USA) as well as Russian MA Program *International Security*. In 1994, launched the first Russian journal on nonproliferation issues, namely *Yaderny Control* (*Nuclear Control*). In 2007, the journal was developed into *Index Bezopasnosti* (*Security Index*), with both Russian and global (English-language) editions. From 2004 to 2008 he was a Professor at the Geneva Centre for Security Policy (GCSP). Starting 2008, he has been working on the concept of BRIC, later BRICS, and its development, particularly on its peace and security basket. As a member of the official Russian delegation, He has participated at the NPT Review Conferences in 2010, 2015, 2022 as a Counselor of the Russian official delegations. He also served as a member of the UN Secretary General's Advisory Board on Disarmament Matters (2015-2018). Author (or co-author) of more than a dozen books and monographs and more than 300 research papers, articles, and essays, including *Nuclear Nonproliferation* textbook. He is developing his Telegram Channel Sobesednik-na-Piru (@ Собеседник-на-Пиру).

DARIA PAKHOMOVA

In 2020, graduated from the School of International Relations at MGIMO University. International Chodiev Foundation Scholarship Recipient (2017). Interned in Rosatom State Corporation (2017, 2018), in the international intergovernmental organization Joint Institute for Nuclear Research (2019), Russian Foreign Ministry (2020). Currently she is a post-graduate student at MGIMO University. Sphere of her research and professional interests includes problems of nonproliferation of weapons of mass destruction, arms control in Russia's relations with foreign states, export control, Middle East. Member of PIR Alumni Community.

SERGEY SEMENOV

In 2019, he graduated from MGIMO University. Since 2019 he has worked at PIR Center, first as an intern and then as a consultant and *Yaderny Control* (*Nuclear Control*) newsletter editor. In 2019-2021, he led the *Nuclear Nonproliferation and Russia* Program at PIR Center, focusing on NPT review process and Russia-US dialogue on strategic stability. Currently, Research Fellow at PIR Center. In 2017-2019, presided over MGIMO Foreign Affairs Club. He authored and co-edited two monographs: *Russia-US Nuclear Nonproliferation Dialogue: Lessons Learned and Road Ahead* (2022); *A New Nuclear Nine? Assessing the Threat of Nuclear Proliferation in the World* (2023).

DMITRY STEFANOVICH

Research Fellow of the Center for International Security at the Primakov National Research Institute of World Economy and International Relations of the Russian Academy of Sciences (IMEMO RAS). Expert at the Russian International Affairs Council (RIAC) and the Valdai Discussion Club. Member of the Council on Foreign and Defense Policy (SVOP) since 2024. In 2019, he was a Visiting Research Fellow at the Institute for Peace Research and Security Policy at the University of Hamburg (IFSH), *Arms Control and Emerging Technologies* Program. He participated in numerous projects under the auspices of international organizations and think tanks, as well as several track 2 and track 1.5 dialogue platforms. Author of a number of papers for academic journals and media. Together with his colleagues he is developing *Vatfor and* STRATDELA projects on international security. Member of PIR Center Advisory Board.

DR. DMITRY TRENIN

PhD in History. Research Professor at the Faculty of World Economy and International Affairs of the Higher School of Economics (HSE University). Academic Supervisor of the Institute of World Military Economy and Strategy at the HSE University. Leading Researcher at the Sector for Non-Proliferation and Arms Limitation of the Center for International Security, Primakov National Research Institute of World Economy and International Relations of the Russian Academy of Sciences (IMEMO RAS). Member of the Council on Foreign and Defense Policy (SVOP) and Russian International Affairs Council (RIAC). In 1972-1993, he served in the Soviet and Russian army. In 1978-1983, he was Liaison Officer in the external relations branch of the Group of Soviet Forces in Germany (Potsdam). From 1985 to 1991 he was a staff member of the Soviet delegation at the Geneva talks on nuclear and space weapons. In 1993, he was a Senior Research Fellow at the NATO Defense College. In 1993-1997, he was a Senior Research Fellow at the Institute of Europe of the Russian Academy of Sciences (RAS). In 1993-1994, he was a Visiting Professor at Free University of Brussels. From 1994 to 2008, he was Head of the Scientific Council, Lead Researcher and Chairman of the Foreign and Security Policy program of the Carnegie Moscow Center. From 2008 to 2022, he was Director of the Carnegie Moscow Center. From 2002 to 2022 he was Member of PIR Center Advisory Board. Member of PIR Center Executive Board Member since 2022.

DR. ALEXEY UBEEV

PhD in Technical Sciences. He headed the Division of Nuclear Nonproliferation, Nuclear Safety and Security of the Department for Security and Disarmament of the Russian Foreign Ministry. He also served as the Deputy Director of the Department of International Cooperation of the Rosatom State Corporation. Former Senior Nuclear Security Officer at the IAEA: Former Senior Nuclear Security Officer at the International Atomic Energy Agency. He participated in the development of a number of important international treaties in the field of nuclear nonproliferation, nuclear safety and security. Participated in elimination of the consequences of the accident at the Chernobyl NPP in 1986. Member of PIR Center Advisory Board.

IGOR VISHNEVETSKY

Former Deputy Director of the Department for Nonproliferation and Arms Control of the Russian Foreign Ministry. Deputy Head of the Russian Delegation at the Tenth NPT Review Conference in 2022. Extraordinary and Plenipotentiary Envoy of the 2nd class. Awarded with the Order of Friendship and Medal of the Order for Merit to the Fatherland, 2nd class (2016). For many years he has been dealing with issues related to export control and nonproliferation, as well as to prohibition of chemical weapons.

DR. ALEXANDER VORONTSOV

PhD in History. Graduated from Lomonosov Moscow State University and Pyongyang Kim Il Sung. Head of the Department for Korean and Mongolian Studies at the Institute of Oriental Studies of the Russia Academy of Sciences (RAS). He also holds post as Russian Military Science Academy Professor. He repeatedly takes part at the track 1.5 and track 2 diplomacy events dealing with the security situation on the Korean Peninsula and East Asia. He was a Visiting Professor at the Hanguk University of Foreign Studies in Seoul from 1998 to 2000; at the Ritsumeikan University in Kyoto, Japan, in 2009, 2012 and 2020; at the Akita International University, Japan, in 2015. Also, he was a Member of the faculty of Yonsei University International Summer School in Seoul in 2010, and a Visiting Fellow at the Brookings Institution Center for Northeast Asian Policy Studies in Washington DC in 2005-2006. Graduated from Asia Pacific-Center for Security Studies Executive Courses in Honolulu in 2005. He served as second secretary in the Russian Federation's Embassy in Pyongyang, the DPRK, from 2000 to 2002. He was the member of the Russian part of the Russia-DPRK, Russia-Republic of Korea intergovernmental commissions dealing with trade-economic and scientific-technical cooperation. In 2012-2022, he was an Associate Professor at the MGIMO University. Member of PIR Center Advisory Board.

ABOUT THE REVIEWER

GENERAL EVGENY BUZHINSKY

Lieutenant-General (Retired), PhD in Military Sciences. In the Armed Services since 1968. Graduated from the Military Institute of Foreign Languages, Frunze Military Academy. In 2002, he was appointed on the position of Head of the International Treaties Department – Deputy Head of the Main Directorate of International Military Cooperation of the Ministry of Defense of the Russian Federation. Retired from active duty in 2009. Deputy CEO of *Vega Radio Engineering Corporation* from 2009 to 2018. In 2009-2017, he was a PIR Center Consultant, then Senior Vice-President. Chairman of PIR Center Executive Board since 2014. From 2016 – Associate Professor and Head of Center for Applied Political-Military Research of School of World Politics, Lomonosov Moscow State University. Professor at the Institute for Advanced Strategic Studies at the Higher School of Economics (HSE University). Vice-President of the Russian International Affairs Council (RIAC). Specialized in arms control, political and military aspects of international security, nonproliferation of weapons of mass destruction, military use of the outer space, Russia-NATO and US-Russia relations.

ABOUT PIR CENTER

PIR Center is a leading Russian non-governmental organization dealing with nuclear nonproliferation, arms control, and other aspects of global security. Our project portfolio is based on four key programs: *Nuclear Nonproliferation and Russia* Program; *Global and Regional Security: New Ideas for Russia*; Education & Training Program; and Information & Publications Program. Since its foundation in 1994 PIR Center has been conducting extensive and diverse research, analytical, educational, training, and publishing activities. Besides, we have always been actively organizing dialogues in the formats of Track 1.5 or Track 2 diplomacy.

Education and training have been our priority for those fruitful and productive 30 years. Since 1997 PIR Center has been developing projects on the issues of nuclear nonproliferation, arms control, disarmament to upgrade the qualifications of the relevant specialists and to raise the generations of new ones. In 2000, PIR Center released its first fundamental textbook *Nuclear Nonproliferation* for universities in Russia and around the globe. 24 years later, it still remains *a must-read* for those wishing to enter the nuclear nonproliferation and arms control expert pools as well as those interested in nuclear-related issues. In 2009, the textbook was used by PIR Center as the basis for an Encyclopedia with general and most important terms in the realm of nonproliferation, arms control and disarmament.

Since 2001 we have annually organized PIR Center International Schools on Global Security for young specialists from all over the world. Since 2015 we have been developing International Dual Degree MA Program *Global Security, Nuclear Policy and WMD Nonproliferation* together with MGIMO University and Middlebury Institute of International Studies at Monterey. In 2024, together with MGIMO University we are launching a new MA Program *International Security* with a focus on nuclear domain-related issues.

At the beginning of the 21st century PIR Center contributed a lot to the preparation of the 2002 UN Secretary General Report *United Nations Study on Disarmament and Non-Proliferation Education*. Since the 2010s it has had consultative status with the UN Economic and Social Council (ECOSOC). Since 1995 representatives of PIR Center have taken part in the NPT review process ensuring its analytical coverage or organizing side-events. Even in 2022, despite adverse circumstances and international tensions, a PIR Center delegation participated in the Tenth NPT Review Conference in face-to-face format. At that time, we were the only Russian NGO participating in the Conference in-person, and our presence in the NPT RevCon in 2022 resulted in a collection of analytical materials with a wide range of articles and interviews about the current problems on nuclear nonproliferation and the Russian understanding thereof, which now are typically cushioned abroad.

Further, we have been paying much attention to preserving the memory of the Soviet and Russian diplomats, officers, civil servants, and experts who contributed to the development of nuclear nonproliferation and arms control regimes. Many of them inspired our projects as well. For example, Ambassador Roland Timerbaev was a founding father

of the Non-Proliferation Treaty. Not only did he take part in numerous talks on the issues of nuclear nonproliferation and arms control as a Soviet diplomat, but he also made significant contributions on the expert and non-governmental level. From 1994 to 1998, Roland Timerbaev was the PIR Center President. From 1999 to 2010, he was a member of PIR Center Executive Board, and later, till the end of his days, Ambassador Timerbaev was a member of PIR Center Advisory Board. He was a good friend, colleague, and mentor for PIR Center teams for many years. PIR Center has launched several initiatives in his memory, for example, Roland Timerbaev Memory Gallery with his main articles, archives and photographs proving his bright career, professional and life path. Some other memory galleries and oral history of nuclear nonproliferation and arms control can be found at our website as well.

The greatest achievement of PIR Center after those 30 years is our PIR Alumni Community. Today it includes more than 1000 people. About 850 of them are graduates of the projects of PIR Center Education & Training Program, be it the International School on Global Security, the Dual Degree MA Program on Nonproliferation Studies (MGIMO-MIIS-PIR Center), internship programs, training courses, or the *International Timerbaev Debates*, etc. PIR Alumni Community members live in Abkhazia, Azerbaijan, Armenia, Belarus, Brazil, Canada, China, Croatia, Czech Republic, Georgia, Germany, Greece, Finland, France, India, Iran, Ireland, Italy, Japan, Kazakhstan, Kyrgyzstan, Madagascar, Mexico, Moldova, Mongolia, Montenegro, North Macedonia, Republic of Korea, Romania, Russia, Slovakia, South Ossetia, Spain, Sweden, Switzerland, Syria, Tajikistan, Turkmenistan, Ukraine, USA, Uzbekistan, etc. After their graduation from our projects, we do our best to engage them in our activities.

PIR Library Series № 36

The textbook *Nuclear Nonproliferation and Arms Control. Digital Papers* was designed as a preparation to, and a continuation of the First PIR Center Online Course on Nuclear Nonproliferation and Arms Control. The *Digital Papers* are intended for a wide foreign English-speaking audience of diplomats and government officials, journalists, employees of research centers and institutes, instructors and students, functionaries of public organizations dealing with international cooperation and public diplomacy, as well as all those who are simply interested in the nuclear domain or adhere to the principle of *life-long learning*. It will also be of interest to Russian specialists who would like to develop their professional vocabulary and conceptual system in English. All of them will have an opportunity to get acquainted with the theoretical approaches to the study of nuclear nonproliferation and arms control regimes, their history, and, of course, the current challenges. To make the *Digital Papers* more diverse, comprehensive, and versatile, offering different perspectives on issues, many Russian experts with different professional background and experience, views, and opinions were invited. The publication of *Nuclear Nonproliferation and Arms Control. Digital Papers* is dedicated to this 30th anniversary of PIR Center founded on April 30, 1994.

pircenter.org

NONPROLIFERATION.WORLD

Telegram Channels

Moscow
2024

SUPPORTED BY
PRESIDENTIAL
GRANTS
FOUNDATION

PIR Center
Non multa, sed multum
1994-2024