

Legal instruments for deterring nuclear conflict in the current military and political geo-environment

Oleh Semenenko*

Doctor of Military Sciences, Deputy Head of the Institute for Scientific Work
Central Research Institute of the Armed Forces of Ukraine
03049, 28B Povitroflotskiy Ave., Kyiv, Ukraine
<https://orcid.org/0000-0001-6477-3414>

Volodymyr Remez

PhD, Lecturer
National Defence University of Ukraine
03049, 28 Povitroflotskiy Ave., Kyiv, Ukraine
<https://orcid.org/0000-0002-2561-1081>

Anatolii Nazarenko

Senior Lecturer
Odesa Military Academy
65009, 10 Fontanska Doroha Str., Odesa, Ukraine
<https://orcid.org/0009-0005-3562-6315>

Valerii Malikov

Senior Lecturer
Odesa Military Academy
65009, 10 Fontanska Doroha Str., Odesa, Ukraine
<https://orcid.org/0000-0003-4273-307X>

Vitalii Stasiuk

Senior Lecturer
Odesa Military Academy
65009, 10 Fontanska Doroha Str., Odesa, Ukraine
<https://orcid.org/0009-0003-2708-5235>

Abstract. The relevance of this study lies in the need to consider the legal instruments for deterring a nuclear conflict in connection with the crisis of nuclear safety and instability in the current military-political geo-environment. The purpose of this study was to examine international experience in the field of legal consolidation of prohibitive norms of deterrence necessary to prevent nuclear threats. The following general scientific and special methods were employed in the study: analysis, synthesis, deduction, induction, generalisation, as well as formal legal, legal hermeneutics, logical-legal, comparative legal, and historical-legal methods. The study examined the specialised international legal framework of regulatory documents in the field of nuclear safety, safe operation of nuclear facilities and nuclear deterrence, as well as nuclear deterrence strategies and their development depending on the geopolitical situation. Based on the results of the study, it is determined that the legal regulation of nuclear conflict containment is in the form of prohibitory orders consolidated in the relevant international treaties in the field of nuclear and radiation safety. The study highlighted the main international treaties positioned as legal means of nuclear deterrence. The interaction of “soft” and “hard” law in nuclear and radiation safety agreements was considered, as well as the specific features of consolidating such norms in municipal law. The study provided generalising conclusions in terms of nuclear deterrence strategies, specifically,

Suggested Citation

Article's History: Received: 23.11.2023 Revised: 29.02.2024 Accepted: 28.03.2024

Semenenko, O., Remez, V., Nazarenko, A., Malikov, V., & Stasiuk, V. (2023). Legal instruments for deterring nuclear conflict in the current military and political geo-environment. *Social & Legal Studios*, 7(1), 87-96. doi: 10.32518/sals1.2024.87.

*Corresponding author



a vision of a new concept in this area, based on technological superiority in non-nuclear means of repelling nuclear strikes and massive precision non-nuclear retaliatory strikes. It was also concluded that attention should be paid to the development of a new international treaty that would combine all the rules prohibiting the use of nuclear energy for military purposes, as well as the rules governing nuclear and radiation safety as integral components of global nuclear security. The practical significance of this study is that its materials can be used for further development of the concepts of non-nuclear or legal nuclear deterrence

Keywords: international security; preventive actions; legislative regulation; peaceful atom; mutually assured destruction

Introduction

In the current period of global security crisis caused by numerous conflicts: Russia's attack on Ukraine, Hamas' attack on Israel, the threat of China's invasion of Taiwan and Houthis' shelling of civilian and military vessels in the Red Sea, international nuclear and radiation safety is of particular importance. Nuclear power plants (NPPs) are defined by state legislation as high-risk facilities, and the system of regulatory, legal, and technical regulation in the field of radiation and nuclear safety is necessary for the normal operation of NPPs. However, nuclear power facilities are not the only source of this type of danger. The states of the nuclear club, including the United States, the Russian Federation (RF), the United Kingdom, France, People's Republic of China (PRC), India, Pakistan, the Democratic People's Republic of Korea (DPRK) and Israel, have nuclear arsenals that, if activated, would most likely lead to the destruction of most of the world's population. That is why it is so important to prevent and deter nuclear conflict in a clear and balanced manner, specifically in the form of prohibitive regulations consolidated in international treaties and conventions, the study of which will help to improve existing and create new legal instruments.

In the works of Ukrainian and European researchers, e.g., from such countries as France and Norway, the issue of nuclear safety is quite relevant. Attention should be drawn to the study by O. Taran *et al.* (2022), which was conducted on the topic of legal protection of nuclear power plants (NPPs) following international humanitarian law. Specifically, the study examines the situation on the territory of Ukraine, investigates the aspects of NPP protection from possible attacks during international armed conflicts following international humanitarian law and focuses on the fact that an attack on a NPP is prohibited, even if it can be classified as a military objective under international humanitarian law. L. Boron *et al.* (2023) examined the scope of special protection granted by international humanitarian law to nuclear facilities in the light of the nuclear safety crisis at Zaporizhzhia NPP (ZNPP), focusing on the unacceptability and illegality of the actions of the RF. Attention should also be paid to the study by B.D.E. Dando *et al.* (2023), which presents an innovative approach to ensure compliance with international law during the war in Ukraine using a seismographic method analogous to that used to monitor compliance with the Comprehensive Nuclear-Test-Ban Treaty. Specifically, the study notes that using the Malyn seismic station PS-45, it was possible to observe local explosions, noting that there were more factual attacks than reported in the media. Furthermore, it was possible to identify and separate different types of attacks and their corresponding seismic data, which, according to the researchers, once again confirms the effectiveness of using seismographic observations for monitoring purposes.

O. Sokolovska (2023) emphasises that nuclear safety requires global solutions, coordination of national measures, conclusion of international legal agreements, and active

involvement of states in voluntary initiatives. Attention is also drawn to the need for a clear architecture of global nuclear and radiation safety, which should be comprehensive, standardised, based on trust and the desire for disarmament. However, a separate aspect of nuclear security, according to V.V. Myronenko (2022b), is the political side of the nuclear deterrence strategy, the decisive factor for which is technological superiority in weapons and methods of application, such as the US nuclear cruise missiles in the context of a hypothetical retaliatory strike. Thus, the increased emphasis on non-nuclear weapons also contributes to nuclear deterrence, acting as a psychological and strategic tool (Musin & Zheksekin, 2023). Nevertheless, O. Buryachenko (2023) notes that as a result of the conflict between RF and Ukraine, which disrupts the global security system, the issue of the use of nuclear weapons is gaining new importance and creates the possibility of a trend towards the proliferation of nuclear weapons in the world as a means of protecting sovereignty. The researcher also notes that the world is currently experiencing a greater security crisis than during the Cold War.

Despite the fruitful activities of researchers, there are still some unexplored aspects in the field of nuclear safety, one of which is the implementation of nuclear deterrence through the international framework of legal acts aimed at deterring nuclear aggression. Thus, the purpose of this study was to provide a full and comprehensive review of the legal instruments for deterring nuclear conflict and a detailed analysis of the legal acts that consolidate them.

Materials and methods

The following general scientific and special methods were used to investigate the specific features of deterring nuclear conflict using legal instruments in the current geopolitical situation in the world: analysis, synthesis, deduction, induction, generalisation, as well as formal legal, legal hermeneutics, logical-legal, comparative legal, and historical-legal methods. The study examined the main mechanisms used to prevent and deter conflict involving nuclear weapons. The study was conducted as follows: firstly, the soft and hard law regulations related to international nuclear and radiation safety were analysed; then, the nuclear deterrence strategies and stages of evolution of the global nuclear deterrence system were considered; the next step was to consider the regulations that are directly legal instruments for deterring nuclear conflict; then, attention was paid to more local and specific aspects, such as lesser-known regional conflicts and certain elements of the legal instruments in the field of nuclear safety and deterrence; finally, the materials obtained during the study were used in the final part of the study.

The study used general scientific research methods. The analysis was used to separate information on the specific features of legal regulation of nuclear conflict deterrence from general information on military and political

factors that influence the possibility of their occurrence. The synthesis was used to combine the specific features of consolidation of legal instruments aimed at international regulation of nuclear deterrence identified during the analysis. Deduction was used for a more in-depth investigation of the features of legal nuclear deterrence and nuclear and radiation safety identified in the synthesis process. Induction was used to form a common opinion on the specific features of legal nuclear deterrence, information about which was obtained during synthesis. The synthesis was used to structure all the features found regarding legal instruments of nuclear deterrence, information on which was obtained using other methods.

The study also used special research methods. The formal legal method was used to examine in detail the legal nuclear deterrence and the international legal instruments through which it is implemented from the perspective of international humanitarian law. The method of legal hermeneutics was used to investigate the practical application of international treaties and conventions, as well as to assess the factual legal situation in the world. The logical-legal method was used to review the provisions of international documents from the standpoint of legal logic and to find discrepancies or inaccuracies in them. The comparative legal method was used to compare various international treaties and conventions and to compare them. The historical-legal method was used to review the historical experience of legal nuclear deterrence.

During the study, international treaties, conventions, and other documents issued by organisations such as the International Atomic Energy Agency (IAEA) were reviewed and analysed in detail. The principal international treaties are as follows: the Treaty on the Non-Proliferation of Nuclear Weapons dated 07/01/1968, the Comprehensive Nuclear-Test-Ban Treaty dated 09/10/1996 and the Treaty on the Prohibition of Nuclear Weapons dated 07/07/2017. At the same time, the following documents were singled out in the field of nuclear and radiation safety: the Joint Protocol for the Application of the Vienna Convention and the Paris Convention dated 09/21/1988 and the Convention on Supplementary Compensation for Nuclear Damage dated 09/12/1997. The IAEA's Series of Publications, which is of a guidance nature, should be highlighted separately.

Results

Modern international humanitarian law is applied as the law of armed conflict (*jus in bello*) to regulate the laws and customs of war, and also includes customary law and rules consolidated in international treaties, including the Additional Protocol to the Geneva Conventions of August 12, 1949, relating to the Protection of Victims of International Armed Conflicts (1977). According to K. Kawai (2022), this right defines the methods, means of warfare, and establishes that such a right has its limitations, which are recognised and accepted internationally. Nuclear deterrence implies that a state tries to intimidate an adversary with an effective nuclear counterattack to prevent it from taking military action. The legal assessment of the nuclear deterrence strategy first falls under Article 2(4) of the Charter of the United Nations (1945), which prohibits the "threat of force" (*jus ad bellum*), and then the "possible threat of force" (*jus ad bellum*). However, if the threat of "possible use" was not considered in deterrence, then such deterrence would be

ineffective. Notably, *jus ad bellum* are the legal conditions for the outbreak of war, while *jus in bello* are the rules of conduct of the belligerents.

Another example that also indicates the simultaneous application of both soft and hard law in the system of legal instruments in the field of nuclear safety is the Convention on Physical Protection of Nuclear Material and Nuclear Installations (1979). According to S. Burns (2022), the Convention is an example of hard law that establishes concrete security obligations that the parties agree to implement in their national programmes and implement in the legal framework. Specifically, Articles 3-6 of the Convention establish obligations to maintain nuclear security in the legal, transport, and law enforcement spheres, as well as to ensure the confidentiality of information relating to nuclear materials that must stay secret according to this Convention. Articles 9 and 10 of the Convention consolidate the inevitability of fair punishment for an offender who has committed, is suspected of having committed, or threatens to commit one of the acts set forth in Article 7 of the Convention. On the other hand, the Code of Conduct on the Safety and Security of Radioactive Sources (2004) is a non-binding code that calls for a political commitment by states to achieve a prominent level of security in the control of radioactive sources. Among other goals, the code calls for preventing the loss, unauthorised access, or illegal transfer of such sources, as well as helping to eliminate possible consequences of their potential use for malicious purposes (Burns, 2022). Thus, Chapter 3 of the Code sets out the basic principles of safe management of radioactive sources, and paragraphs 18 and 19 of the Code contain detailed recommendations on the necessary legislative initiatives to implement the basic principles in national legislation. The Code also contains Appendix 1, which proposes the division of nuclear sources into three categories, which are formed according to the maximum time of possible contact with a radioactive source without proper radiation protection means before irreversible injuries are sustained.

Legal instruments can also be used not only in the field of nuclear and radiation safety, but also to legally consolidate global principles of nuclear deterrence. Deterrence strategies in the era of nuclear weapons emerged as a response to their proliferation in the arsenals of states, however, according to K. Kang and J. Kugler (2023), the methods of achieving and maintaining long-term stability are characterised by specific features. The first concepts of nuclear deterrence emerged after the end of World War II. After observing the events in Hiroshima and Nagasaki, B. Brodie (1946) determined that the advent of nuclear weapons had changed the nature of warfare. The large-scale destruction of numerous military or civilian objects and enemy troops or population became possible in a few days, not years of total war. Brodie stated that Clausewitz principles of war have lost their force in the nuclear age, arguing that because of the "unacceptable" destructive potential of nuclear weapons, which he called "absolute", war with their use is not a continuation of politics by other means. A first strike should be considered an unacceptable means, and the only purpose of having nuclear weapons in the state's arsenal should be to threaten disproportionate massive retaliation against potential enemies. This initial position of deterrence, which included refraining from the use of nuclear weapons by the first party and massive retaliation (MR), was later expanded to include the principle of mutually assured destruction (MAD) (Brodie, 1959).

The first nuclear deterrence strategies were based solely on the nuclear superiority of the United States of America (US), but they were eventually revised due to the intensive growth of the Soviet Union's (USSR's) nuclear arsenal. With the proliferation of strategic nuclear weapons, the concept of MR loses its effectiveness and becomes inappropriate, leaving MAD as the only possible deterrence strategy. Apart from long-range bombers, mass production of intercontinental ballistic missiles and ballistic missiles for submarines began in the mid-1960s (Kang & Kugler, 2023). However, over time, the United States has moved to a strategy of extended deterrence and a format of cooperation with non-nuclear states in the form of the so-called "nuclear umbrella". According to D.Y. Lee (2021), it is the introduction of security commitments for allies that is a key part of the US initiative aimed at preserving international peace and preventing the global proliferation of nuclear weapons. South Asia became another region of nuclear confrontation in the second half of the 20th century. During the conflict between India and Pakistan, both countries acquired nuclear weapons. India became the first country in the region to obtain the status of a nuclear power, motivated by the desire to improve its international status. Pakistan has also developed a nuclear programme, but for reasons of defence against India. According to M. Sadiq and I. Ali (2023), both countries have stuck to the concepts of the Cold War and the MAD.

After the full-scale invasion of Ukraine by the RF on 02/24/2022, states have witnessed growing instability and complications in maintaining peace and stability in the world, specifically due to the threats of the terrorist country

of Russia to use nuclear weapons in case of any intervention in the conflict with Ukraine and the creation of a critical nuclear security situation at the ZNPP occupied by Russian troops. The threats of nuclear strikes were directed primarily at NATO states as Ukraine's main potential allies, while the seizure of the ZNPP was aimed at putting pressure on Ukraine. The conditions of global challenges facing humanity require the restoration of cooperation and solidarity, but, according to V. Myronenko (2022a), there is a rapid disintegration of the modern international legal order and institutions that are designed to form coherent power-political relations at the global level. Notably, recent events in Yemen indicate a shift from international condemnation to a position of strength. Thus, Houthi attacks on civilian and military vessels since 11/19/2023 received a harsh response from the United States and the United Kingdom on 01/12/2024 (Strike on Yemen..., 2024). Therefore, the unsuccessful diplomatic efforts of the United Nations (UN) have led to an intensification of the stagnation of international relations, which has primarily resulted in radicalisation in the resolution of armed conflicts. This approach differs from the general trend of recent decades towards a looser security framework. Relations among the nuclear powers are the tensest, as they understand the potential of their weapons of mass destruction better than anyone else. An asymmetric response to the proliferation of nuclear weapons in the arsenals of states is the development of non-nuclear precision weapons and a global missile defence system (MDS).

It is also worth paying attention to the statistical data on nuclear weapons in the world, as presented in the table below (Table 1).

Table 1. Number of nuclear warheads in the arsenals of the world's states

State	Number of nuclear warheads	Strategic warheads deployed	Trend
RF	5,977	1,588	Probably increasing stocks
USA	5,428	1,644	Slowly reducing stocks
PRC	350	-	Stocks increase
France	290	280	Stocks are stable
United Kingdom	225	120	Stocks increase
Pakistan	165	-	Stocks increase
India	160	-	Stocks increase
Israel*	90	-	Stocks are stable
DPRK	20	-	Stocks increase

Note: *unofficial assessment by experts, as Israel has never openly declared either the presence or absence of nuclear weapons

Source: based on infographics from the analytical portal "Slovo i Dilo" ("Nuclear club": How..., 2022)

The information presented in the table suggests that most nuclear-armed states are not ready to give up increasing the number of nuclear weapons. Of the 8 official nuclear club states, only 2 are reducing or not increasing their stockpiles. However, only 4 of the 8 nuclear-armed states have deployed strategic warheads, i.e., can use them in a short time. These states should be considered the key actors in global nuclear deterrence.

As nuclear weapons are a matter of global concern, the legal framework for nuclear deterrence instruments goes beyond the internal laws and regulations of individual countries and includes international agreements, conventions, and treaties. According to T.A. Kukharenko (2023), this international legal framework is aimed at preventing the proliferation of nuclear weapons and promoting disarmament.

International nuclear security legislation includes a range of treaties, such as the Convention on the Physical Protection of Nuclear Material and its amendments, as well as various soft law instruments, such as the IAEA Nuclear Security Series. According to Y. Fukui (2024), these legal documents act as guiding principles, determining the course of policy and ensuring an appropriate level of protection for various nuclear facilities. Soft law is usually characterised by flexibility and normativity, but in the area of nuclear security, assessment is mainly carried out through instruments that are properly implemented by the relevant regulators or operators, and regulators are given the power to order operators to comply with binding instructions at the level of municipal law. When the provisions of such documents are incorporated into municipal law, they function as "hard" laws,

despite their definition as international “soft” law. This unique approach allows for effective control over nuclear security while providing sufficient flexibility to adapt different nuclear facilities to the conditions necessary for their protection.

The key legal instrument in the context of international nuclear safety and deterrence is the Treaty on the Non-Proliferation of Nuclear Weapons (1968), which was ratified by 191 countries. According to this treaty, each non-nuclear-weapon state party undertakes to refrain from accepting nuclear weapons and not to manufacture or acquire them. The Treaty also recognises the right of states to develop nuclear energy for peaceful purposes, subject to safeguards and inspections by the IAEA, which was established on 07/29/1957. Notably, the treaty contains outdated provisions: despite the possibility of amending it following Article 8 of the Treaty, Article 9 of the Treaty stipulates that ratifications and instruments of accession are deposited with certain governments, including the USSR, which collapsed over 30 years ago. Article 7 of the Treaty is also questionable, stating that it does not limit the right of states to regional agreements to ensure the complete absence of nuclear weapons on their territories. The question arises as to why such an international treaty immediately stipulates the absence of mechanisms to influence individual states, which effectively relieves the main regulator in this area, i.e., the IAEA, of any responsibility for inaction or ineffective actions. Other significant international treaties related to nuclear weapons are the Comprehensive Nuclear-Test-Ban Treaty (1996) and the Treaty on the Prohibition of Nuclear Weapons dated 07/07/2017. Article 2 of the Comprehensive Nuclear-Test-Ban Treaty states that each State Party undertakes to refrain from inducing, encouraging, or taking any part in the conduct of any nuclear weapon test explosion or any other nuclear explosion. This treaty absolutely prohibits all nuclear weapons testing. However, clause 6 of Article 6 of the Treaty states that the provisions of this Article shall not prevent the implementation of the provisions of Articles 4 and 5 of this Treaty. Again, questions arise as to the logical structure of an international treaty, since it is the correct interpretation of it by all member states that is the key to its implementation. Article 1 of the Treaty on the Prohibition of Nuclear Weapons (2017) states that each State Party undertakes never, under any circumstances, to develop, test, produce, manufacture, acquire, possess or stockpile nuclear weapons or other nuclear explosive devices. This treaty completely prohibits the possession and use of nuclear weapons.

Although the preamble to the document uses the phrase that the signatory states are “deeply concerned” about the humanitarian consequences of any use of nuclear weapons, the overall text of the document is sharper and clearer. It should be emphasised that all these treaties are major steps for the international community towards limiting and further abandoning nuclear weapons (Kukharenko, 2023). According to O.V. Buriachenko (2023), it is the defence against the means of self-destruction created by humankind itself that should occupy the principal place in the global security system of this century. Thus, the countries possessing nuclear weapons should abandon them in favour of creating a “global nuclear umbrella” to ensure stability in nuclear security.

Notably, the entry into force of the Treaty on the Prohibition of Nuclear Weapons in January 2021 has led to an intense discussion on positive obligations under Article 6 of the Treaty. However, according to C.P. Evans (2023), while the issue of aid to victims under Article 6(1) has received considerable attention, the obligation to restore the environment under Article 6(2) is still understudied. Specifically, there is considerable uncertainty as to the scope of activities covered by the application of the rules of treaty interpretation set out in the 1969 Vienna Convention on the Law of Treaties.

A separate aspect of legal norms in the field of nuclear safety and deterrence is legal instruments aimed at bringing to justice those responsible for radiation contamination. Among the main documents in this area are the Paris and Vienna Conventions on Nuclear Liability, which were merged in 1988 by the Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention (1988). Additional negotiations led to proposals for amendments to the Vienna Convention and the creation of a new Convention on Supplementary Compensation for Nuclear Damage (1997), which entered into force in 2015 and strengthened compensation for nuclear damage to property and/or health. In 2004, the parties to the Paris and Brussels Additional Conventions concluded negotiations on their revision, but the changes did not enter into force until 2022 and focused on expanding the list of mandatory prevention and recovery measures. Even though the Chernobyl accident became a catalyst for research and improvement of the liability system, the implementation of changes took time (Burns, 2022). It should also be noted that, despite the tragic experience of Chernobyl, peaceful nuclear energy is being used quite actively in the world (Table 2).

Table 2. Countries with the largest number of nuclear reactors

State	Number of nuclear reactors
USA	92
France	56
PRC	55
RF	37
South Korea	24
India	19
Canada	17
Ukraine	15
United Kingdom	11
Japan	10
Total in the EU	104
Total in the world	411

Source: based on infographics from the analytical portal “Slovo i Dilo” (How many nuclear..., 2022)

Having analysed nuclear deterrence strategies, trends in missile defence and precision-guided weapons, the concept of a new nuclear deterrence strategy should be presented. The concept is based on non-nuclear massive retaliation (NMR), combined with technological superiority in the field of high-precision missile and anti-missile weapons of all ranges. It is non-nuclear missile weapons deployed on the territory of a state or allied states that should be capable of effectively shooting down nuclear missiles, as well as of devastatingly retaliating against all detected enemy launchers to prevent a second attack as a key element of NMR. Along with extended deterrence and the introduction of the “global nuclear umbrella”, the NMR should gradually replace the nuclear doctrine with the technological one, placing all responsibility for the use of the nuclear arsenal solely on the party that has not adhered to the nuclear disarmament policy. The most appropriate document to legally consolidate this strategy is the NATO Strategic Concept, as NATO has become the point of unification for such nuclear-armed countries as the United States, France, and the United Kingdom, which are among the four countries with deployed strategic warheads and, as already mentioned, are among the main actors of global nuclear deterrence.

Discussion

Considering the issues of international humanitarian law and state policy in the field of nuclear weapons, attention should be paid to the study by S. Fetter and Ch. Glaser (2022). They note that about a decade ago, a new interpretation of the law of armed conflict (*jus in bello*) emerged in the US nuclear strategy. This was partly conditioned by a series of major international conferences aimed at investigating the humanitarian consequences of the use of nuclear weapons, which led to the agreement among a group of countries that the use of nuclear weapons would lead to catastrophic consequences and unacceptable suffering of military personnel or civilians and thus violate the principles of the law of armed conflict (*jus in bello*), which generally coincides with the opinion of B. Brodie (1946). This rationale became a key one in efforts to ban nuclear weapons, specifically in the Treaty on the Prohibition of Nuclear Weapons of 07/07/2017, which was signed by 86 countries and 59 states parties at that time. The researchers focus on the US response to this treaty, which stated that it does not target civilians as such, but that such a position would not lead to targeted efforts to avoid using its nuclear weapons in a way that would avoid or minimise the consequences for the enemy's civilian population. It is impossible to disagree with the inadmissibility of the use of nuclear weapons, although the development, construction, and testing of such weapons are irresponsible and criminal acts. Following the laws and customs of war (*jus in bello*), plans and decisions to use military force must be guided by the principles of necessity, distinction, proportionality, and precaution to avoid attacks on civilians and objects, while ensuring the right to counterattack military objectives, including strategic nuclear command and control facilities. However, the very creation of nuclear weapons contradicts the principle of necessity, since in the history of its existence, fortunately for the entire world, there has not been a single case of active use of this type of weapon, although enormous funds have been spent on its production and maintenance. In line with the growing international support for the Treaty and

other initiatives to stigmatise nuclear weapons, the United States, in compliance with international law, has begun to move towards changing its nuclear arsenal policy to ensure that its strategic plans for the use of nuclear weapons are fully consistent with the Treaty (Shopina *et al.*, 2020). This also once again characterises the United States as the only actor in the global nuclear deterrence that has enough determination to take voluntary steps in the field of nuclear and radiation safety.

Considering the tension between NATO and Russia, and the statements of the latter's propagandists about the total destruction of certain states in Europe, some researchers propose a more humane and balanced nuclear deterrence strategy (Yankovskyi, 2023). Thus, S.D. Sagan (2023) has formulated the following principles of nuclear deterrence aimed at improving the fairness and effectiveness of the US nuclear deterrence policy in the future. Firstly, it is imperative to break the link between the mass murder of innocent civilians and nuclear deterrence, instead recognising military forces and the enemy's top political leadership as the only legitimate target. Secondly, the use or planning of nuclear weapons against any target that can be destroyed or neutralised by conventional weapons should be abandoned. The third principle is to avoid belligerent threats of retaliation against civilians, even in response to hostile attacks on their own or allied civilians. The fourth principle emphasises cooperation in good faith towards nuclear disarmament as the ultimate purpose of nuclear deterrence. However, based on the results of the study, the United States is the only country that can adopt such a strategy, as it is the only one that continues to voluntarily reduce its nuclear arsenal. Notably, the proposed principles can be applied only to long-term strategies, as their implementation is impossible in the near future due to the global security crisis.

Considering the issue of international humanitarian law, the RF violated international law by annexing the Crimean Peninsula and violating the principle of the use of force and numerous treaties protecting the sovereignty and territorial integrity of Ukraine, which, according to K. Kawai (2022), is entitled to self-defence following international humanitarian law and the right to demand that Russia be brought to justice. Agreeing with this opinion, it should be added that the RF should also be restricted in international institutions where its representatives are present, as someone who does not respect any opinion of the international community should be restricted in the platforms where they can express their own. However, according to A. Mahmutovic (2023), the possession of nuclear weapons by a state may complicate the international community's response. The International Criminal Court is investigating the situation in Ukraine and will prosecute individuals for international crimes, but it is the national courts that play a crucial role in ensuring justice, as they are factually the primary means of recording violations of international criminal law by collecting evidence and making corresponding court decisions (Pilyukov *et al.*, 2023). Apart from the International Criminal Court, the International Court of Justice operates in the field of international humanitarian law, which, according to C. Greenwood (2022), has made a considerable contribution to the development and interpretation of international humanitarian law, working both within its advisory jurisdiction and within the jurisdiction of dispute resolution. The Court's judgments and advisory opinions in various cases have

contributed to the regulation of armed conflicts, demonstrating interaction with other bodies of international law, and have influenced the development of non-binding rules of international humanitarian law. However, it is impossible to bring a state to international responsibility if it does not consider international law itself.

One of the possible solutions to local nuclear security crises is the voluntary disarmament of small nuclear-armed countries, such as Islamic Republic of Iran (IRI) or the DPRK, but first of all, this requires a decision of the military and political leadership of these countries, which can be achieved through diplomacy or sanctions (Yefimenko *et al.*, 2023). According to N. Fahmy (2022), ensuring the non-proliferation of nuclear weapons and disarmament in the Middle East is a prerequisite for ensuring security and stability in the region. The resumption of negotiations on the Joint Comprehensive Plan of Action (2015) – the nuclear agreement signed in Vienna on 07/14/2015 between the IRI and the P5+1 group – could be the first step in creating a nuclear-weapon-free zone in the Middle East. This zone is a key element of the new security architecture in the region and should be based on two main principles: disarmament and conflict resolution based on international law. Admittedly, the creation of a safe zone would be a significant event, but international treaties create a dilemma: on the one hand, the technological development of the Middle East will allow the region to overcome the depression, but the presence of nuclear programmes in countries such as IRI calls into question the exclusively peaceful use of nuclear energy and creates the possibility of nuclear proliferation. However, considering the policies of the nuclear club countries, it can be concluded that most of them are also not ready for nuclear disarmament and curtailment of nuclear programmes, especially now, when even partial disarmament of one of the states, such as the United States or Pakistan, will be perceived as weakness, not a desire to reduce tension, and will lead to greater activation of aggressor states.

Apart from the immediate danger from the use of nuclear weapons, one should not forget about the environmental damage that can be caused by peaceful nuclear facilities. Thus, J. Liu and L. Shen (2022) consider the use of nuclear energy for peaceful purposes, which is of great importance for ensuring energy security, reducing greenhouse gas emissions and achieving sustainable development without harming the environment. Taking the PRC as an example, as a country with a considerable number of active nuclear power plants, effective accident prevention is the most effective way to ensure nuclear safety (Abaikyzy *et al.*, 2020). However, even considering environmental protection, the PRC currently has only two laws dedicated to nuclear safety – The Act of the People's Republic of China on Prevention and Control of Radioactive Pollution (2003) and The Nuclear Safety Law of the People's Republic of China (2017). This does not fully satisfy the requirements of nuclear safety oversight, which S. Burns (2022) would most likely agree with, but the development of nuclear safety legislation reflects the historical process of development and application of nuclear technologies in China. Nevertheless, the PRC's nuclear safety legal system still has shortcomings, such as the absence of a law on nuclear energy, which requires measures to further develop and improve this system, as well as to eliminate conflicts of concepts in legislative acts, such as the difference between the concept of “nuclear safety” in the

Law of the PRC on Nuclear Safety and its concrete content. Furthermore, according to researchers, the development of PRC's nuclear safety legislation will not only promote the development of the nuclear industry but will also contribute to the effective prevention of radioactive contamination incidents and sustainable environmental protection. Agreeing with the researchers' opinion, it should be added that PRC is at the stage of development and formation as a leading state in its region, and given the historical past of this country, it still has many internal issues, which cannot but affect the quality of nuclear and radiation safety.

Thus, the issues of nuclear and radiation safety are undoubtedly one of the most pressing issues of today and are very popular among researchers, but the interaction of nuclear power facilities and the environment, nuclear deterrence strategies and legal instruments to deter nuclear conflict are still its understudied aspects.

Conclusions

Thus, having considered the issue of implementing nuclear deterrence using legal instruments that are especially necessary for maintaining nuclear and radiation safety in the current period of the global security crisis, the principal instruments were identified. These include international treaties such as the Treaty on the Non-Proliferation of Nuclear Weapons, the Comprehensive Nuclear-Test-Ban Treaty, and the Treaty on the Prohibition of Nuclear Weapons. When signed, ratified and/or implemented into national legislation, these legal acts become an effective means of regulating international and national legal relations, deterring nuclear safety crises and ensuring the normal functioning of nuclear energy. However, some of the provisions of these treaties are outdated, inaccurate or, on the contrary, reflect a new, more logical and clear approach to drafting the text of an international document.

Thus, attention should be drawn to the following specific features of these treaties identified in this study, which are that the Treaty on the Non-Proliferation of Nuclear Weapons in Article 9 mentions the government of the USSR, Article 7 lacks clear definition of implementation mechanisms; in the Comprehensive Nuclear-Test-Ban Treaty, clause 6 of Article 6 contains a violation of the logical structure of the document. Generally, the Treaty on the Prohibition of Nuclear Weapons has the clearest wording among the mentioned treaties. The study also examined nuclear deterrence strategies, which resulted in the concept of a new MR strategy based on NMR, the main elements of which are technological superiority in non-nuclear missile weapons, advanced deployment of missile defence systems, and complete rejection of nuclear response to a nuclear attack. Thus, if the concept is incorporated into NATO's Strategic Concept, the bloc's possible response to a nuclear attack will not go beyond international law and will contribute to the establishment of a “global nuclear umbrella”. It is important to note that there is a requirement to enhance and strengthen the regulations outlined in these international treaties through a new regulatory document.

This article should provide a clear and rigorous definition of liability for any violations of nuclear and radiation safety. Drafting of such a treaty and a more thorough analysis of these existing treaties may be the topics of further research and, at the same time, will serve to develop the concepts of legal nuclear deterrence.

Acknowledgements

None.

Conflict of interest

None.

References

- [1] Abaikyzy, M., Yerkinbayeva, L.K., Aidarkhanova, K.N., Aigarinova, G.T., & Baimbetov, N.S. (2020). The formation of land conservation principles as the framework for the implementation of the concept of sustainable development of society. *Journal of Landscape Ecology (Czech Republic)*, 13(3), 23-38. doi: 10.2478/jlecol-2020-0015.
- [2] Additional Protocol to the Geneva Conventions of August 12, 1949, Relating to the Protection of Victims of International Armed Conflicts. (1977, June). Retrieved from https://zakon.rada.gov.ua/laws/show/995_199#Text.
- [3] Boron, L., Gouin, E., & Sauvourel, C. (2023). [International humanitarian law and nuclear power plants: What rules apply to the Zaporizhia plant?](#) *Quebec Journal of International Law*, 2023, 173-194.
- [4] Brodie, B. (1946). *The absolute weapon: Atomic power and world order*. Manchester: Ayer.
- [5] Brodie, B. (1959). *Strategy in the missile age*. Princeton: Princeton University Press.
- [6] Buriachenko, O.V. (2023). The Russian-Ukrainian war as a factor in the disruption and evolution of global security balance. *Scientific Journal "Politicus"*, 2, 73-83. doi: 10.24195/2414-9616.2023-2.11.
- [7] Burns, S. (2022). [Milestones in nuclear law: A journey in nuclear regulation](#). In *Nuclear law: The global debate* (pp. 55-73). Hague: T.M.C. Asser Press.
- [8] Buryachenko, O. (2023). Crisis of the nuclear weapons control system: Challenges of the 21st century and risks of the future. *Scientific Works of the Interregional Academy of Personnel Management. Political Science and Public Administration*, 1(67), 19-30. doi: 10.32689/2523-4625-2023-1(67)-3.
- [9] Charter of the United Nations. (1945, June). Retrieved from https://unic.un.org/aroundworld/unics/common/documents/publications/uncharter/UN%20Charter_Ukrainian.pdf.
- [10] Code of Conduct on the Safety and Security of Radioactive Sources. (2004, January). Retrieved from https://www-pub.iaea.org/MTCD/Publications/PDF/Code-2004_web.pdf.
- [11] Comprehensive Nuclear-Test-Ban Treaty. (1996). Retrieved from https://treaties.un.org/doc/Treaties/1997/09/19970910%2007-37%20AM/Ch_XXVI_04p.pdf.
- [12] Convention on Physical Protection of Nuclear Material and Nuclear Installations. (1979, October). Retrieved from https://zakon.rada.gov.ua/laws/show/995_024#Text.
- [13] Convention on Supplementary Compensation for Nuclear Damage. (1997, July). Retrieved from <https://www.iaea.org/sites/default/files/infirc567.pdf>.
- [14] Dando, B.D.E., Goertz-Allmann, B.P., Brissaud, Q., Köhler, A., Schweitzer, J., Kværna, T., & Liashchuk, A. (2023). Identifying attacks in the Russia-Ukraine conflict using seismic array data. *Nature*, 621, 767-772. doi: 10.1038/s41586-023-06416-7.
- [15] Evans, C.P. (2023). Examining the scope of nuclear weapons-related activities covered under the environmental remediation obligation of the treaty on the prohibition of nuclear weapons. *Asian Journal of International Law*, 13(2), 365-390. doi: 10.1017/S2044251322000546.
- [16] Fahmy, N. (2022). Nuclear non-proliferation and disarmament in the Middle East. *Journal for Peace and Nuclear Disarmament*, 5(1), 101-113. doi: 10.1080/25751654.2022.2078140.
- [17] Fetter, S., & Glaser, C. (2022). Legal, but lethal: The law of armed conflict and US nuclear strategy. *Washington Quarterly*, 45(1), 25-37. doi: 10.1080/0163660X.2022.2054121.
- [18] Fukui, Y. (2024). International nuclear security law: The use of "soft law". *Journal of Conflict and Security Law*. doi: 10.1093/jcsl/krad017.
- [19] Greenwood, C. (2022). The International Court of Justice and the development of international humanitarian law. *International Review of the Red Cross*, 104(920-921), 1840-1855. doi: 10.1017/S181638312200100X.
- [20] How many nuclear reactors are there in the world and how many years have they been operating. (2022). Retrieved from <https://www.slovoidilo.ua/2022/12/05/infografika/svit/skilky-sviti-yadernyx-reaktoriv-ta-skilky-rokiv-vony-pracyuyut>.
- [21] Joint Comprehensive Plan of Action. (2015, July). Retrieved from https://www.eeas.europa.eu/sites/default/files/iran_joint-comprehensive-plan-of-action_en.pdf.
- [22] Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention. (1988, May). Retrieved from <https://www.iaea.org/sites/default/files/infirc402.pdf>.
- [23] Kang, K., & Kugler, J. (2023). Beyond deterrence: Uncertain stability in the nuclear era. *Conflict Management and Peace Science*, 40(6), 655-674. doi: 10.1177/07388942221149670.
- [24] Kawai, K. (2022). Japan's Reliance on US extended nuclear deterrence: Legality of use matters today. *Journal for Peace and Nuclear Disarmament*, 5(1), 162-184. doi: 10.1080/25751654.2022.2071053.
- [25] Kukharenko, T.A. (2023). [Nuclear and non-nuclear state status: World experience and Ukraine](#). Mykolaiv: Black Sea National University named after Petro Mohyla.
- [26] Lee, D.Y. (2021). Strategies of extended deterrence: How states provide the security umbrella. *Security Studies*, 30(5), 761-796. doi: 10.1080/09636412.2021.2010887.
- [27] Liu, J., & Shen, L. (2022). On the legal mechanism of nuclear safety in China under the background of environmental protection. *IOP Conference Series: Earth and Environmental Science*, 1087, article number 012023. doi: 10.1088/1755-1315/1087/1/012023.
- [28] Mahmutovic, A. (2023). Did Russia invade international law in Ukraine. *Access to Justice in Eastern Europe*, 6. doi: 10.33327/AJEE-18-6S003.
- [29] Musin, K.S., & Zheksekin, A.K. (2023). The role of nuclear weapons in modern global politics. *Foreign Affairs*, 33(6), 40-51. doi: 10.46493/2663-2675.33(6).2023.40-51.

- [30] Myronenko, V. (2022a). [Deterrence of large-scale military operations as the main purpose of missile and nuclear programs](#). In *Materials of the international scientific and practical conference "International legal assessment of Russian military aggression in Ukraine and protection of fundamental human rights"* (pp. 69-71). Kyiv: Lyudmila Publishing House.
- [31] Myronenko, V.V. (2022b). The political strategy of "nuclear deterrence" in the missile and nuclear programs of the world's leading states. In *Proceeding of the IX international scientific and practical conference "Promising ways of solving scientific problems"* (pp. 183-185). Brussels: European Conference.
- [32] "Nuclear club": How many warheads are available in the countries of the world and how many of them are deployed. (2022). Retrieved from <https://www.slovoidilo.ua/2022/09/26/infografika/polityka/yadernyj-klub-skilky-boyeholovok-ye-nayavnosti-krayin-svitu-ta-skilky-nyx-rozhornuti>.
- [33] Pilyukov, Yu., Yusupov, V., Banakh, S., & Shramko, O. (2023). [Peculiarities of the investigator's inspection of buildings and structures subjected to artillery shelling and bombing during the investigation of war crimes](#). *Law, Policy and Security*, 1(1), 41-54.
- [34] Sadiq, M., & Ali, I. (2023). Challenges of nuclear deterrence stability in South Asia. *Journal of Asian and African Studies*, 58(8), 1511-1527. doi: 10.1177/00219096221090636.
- [35] Sagan, S.D. (2023). Just and unjust nuclear deterrence. *Ethics and International Affairs*, 37(1), 19-28. doi: 10.1017/S0892679423000035.
- [36] Shopina, I., Khomiakov, D., Khrystynchenko, N., Zhukov, S., & Shpenov, D. (2020). Legal and organizational support in leading countries, NATO and EU standards. *Journal of Security and Sustainability Issues*, 9(3), 977-992. doi: 10.9770/jssi.2020.9.3(22).
- [37] Sokolovska, O. (2023). Global nuclear security: Current policy emphasis. *Bulletin of NTUU "KPI". Political Science. Sociology. Law*, 1(57), 128-134. doi: 10.20535/2308-5053.2023.1(57).280813.
- [38] Strike on Yemen. Why did the USA and Britain attack the Yemeni Houthis and will it turn into a war. (2024). Retrieved from <https://www.bbc.com/ukrainian/articles/cn4999387y1o>.
- [39] Taran, O., Sandul, O., Rogatiuk, I., & Bodnar, V. (2022). Protection of nuclear power plants under international humanitarian law. *International armed conflict in Ukraine. Nuclear and Radiation Safety*, 4(96), 39-44. doi: 10.32918/nrs.2022.4(96).05.
- [40] The Act of the People's Republic of China on Prevention and Control of Radioactive Pollution. (2003, June). Retrieved from <https://nnsa.mee.gov.cn/english/resources/laws/201805/P020180523610883384175.pdf>.
- [41] The Nuclear Safety Law of the People's Republic of China. (2017, September). Retrieved from https://www.oecd-nea.org/law/legislation/2017_china_nuclear_safety_law.pdf.
- [42] Treaty on the Non-Proliferation of Nuclear Weapons (1968, July). Retrieved from https://zakon.rada.gov.ua/laws/show/995_098#Text.
- [43] Treaty on the Prohibition of Nuclear Weapons. (2017, July). Retrieved from https://treaties.un.org/doc/Treaties/2017/07/20170707%2003-42%20PM/Ch_XXVI_9.pdf.
- [44] Yankovskyi, S. (2023). Ukraine's nuclear security as a key element of the European security system. *Law. Human. Environment*, 14(3), 102-114. doi: 10.31548/law/3.2023.102.
- [45] Yefimenko, I., Slipchenko, V., & Vaško, A. (2023). Critical infrastructure as an object of criminal encroachment: General characteristics and features of the investigation organisation. *Scientific Journal of the National Academy of Internal Affairs*, 28(2), 41-51. doi: 10.56215/naia-herald/2.2023.41.

Правові інструменти стримування ядерного конфлікту в сучасному воєнно-політичному геосередовищі

Олег Михайлович Семененко

Доктор військових наук, заступник начальника інституту з наукової роботи
Центральний науково-дослідний інститут Збройних Сил України
03049, просп. Повітрофлотський, 28Б, м. Київ, Україна
<https://orcid.org/0000-0001-6477-3414>

Володимир Володимирович Ремез

Доктор філософії, викладач
Національний університет оборони України
03049, просп. Повітрофлотський, 28, м. Київ, Україна
<https://orcid.org/0000-0002-2561-1081>

Анатолій Валентинович Назаренко

Старший викладач
Військова академія
65009, вул. Фонтанська дорога, 10, м. Одеса, Україна
<https://orcid.org/0009-0005-3562-6315>

Валерій Валерійович Маліков

Старший викладач
Військова академія
65009, вул. Фонтанська дорога, 10, м. Одеса, Україна
<https://orcid.org/0000-0003-4273-307X>

Віталій Сергійович Стасюк

Старший викладач
Військова академія
65009, вул. Фонтанська дорога, 10, м. Одеса, Україна
<https://orcid.org/0009-0003-2708-5235>

Анотація. Актуальність цього дослідження полягає в необхідності розгляду правових інструментів стримування ядерного конфлікту у зв'язку з кризою ядерної безпеки та нестабільністю в сучасному військово-політичному геосередовищі. Метою дослідження є вивчення міжнародного досвіду у сфері правового закріплення заборонних норм стримування, необхідних для запобігання ядерним загрозам. У дослідженні використовувалися такі загальнонаукові та спеціальні методи: аналіз, синтез, дедукція, індукція, узагальнення, а також формально-юридичний, юридичної герменевтики, логіко-юридичний, порівняльно-правовий та історико-правовий методи. Предметом дослідження стала спеціалізована міжнародно-правова база нормативних документів у сфері ядерної безпеки, безпечної експлуатації ядерних установок та ядерного стримування, а також стратегії ядерного стримування та їх розвиток залежно від геополітичної ситуації. За результатами дослідження визначено, що правове регулювання стримування ядерних конфліктів здійснюється у формі заборонних приписів, закріплених у відповідних міжнародних договорах у сфері ядерної та радіаційної безпеки. У дослідженні виокремлено основні міжнародні договори, які позиціонуються як правові засоби ядерного стримування. Розглянуто взаємодію «м'якого» та «твердого» права в угодах з ядерної та радіаційної безпеки, а також особливості закріплення таких норм у муніципальному праві. Дослідження надало узагальнюючі висновки щодо стратегій ядерного стримування, зокрема, бачення нової концепції у цій сфері, що базується на технологічній перевазі у неядерних засобах відбиття ядерних ударів та масованих високоточних неядерних ударів у відповідь. Також зроблено висновок про необхідність приділити увагу розробці нового міжнародного договору, який об'єднав би всі норми, що забороняють використання ядерної енергії у військових цілях, а також норми, що регулюють ядерну та радіаційну безпеку як невід'ємні складові глобальної фізичної ядерної безпеки

Ключові слова: міжнародна безпека; превентивні дії; законодавче регулювання; мирний атом; взаємно гарантоване знищення