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## Ukraine's nuclear security as a key element of the European security system

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### Abstract

Ukraine, as a strategically located territory and an important player in the geopolitical interests of various power blocks, has become a key element of the European nuclear security system, so it is important to study the most important factors shaping the situation around nuclear weapons and take appropriate measures to avoid potential threats. The research aims to outline all aspects and factors of Ukraine's nuclear security that directly affect the international security system, in particular, the European countries. The methodological basis of the study is a systematic analysis of information and regulatory sources, such as bilateral and multilateral international agreements, documents and materials of international organisations, documents of individual country authorities, speeches, and materials of print and electronic media. The article highlights the historical context, including the transfer of Ukrainian nuclear weapons materials to Russia following the Treaty on the Non-Proliferation of nuclear weapons. The current stage of development of the international nuclear non-proliferation regime is analysed. Attention is paid to the evolution of the regime under the influence of the confrontation between the two superpowers and the doctrine of mutual deterrence. The situation with nuclear security in Ukraine and its impact on the Black Sea

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region is analysed. The consequences of military actions in Ukraine and factors that create new dimensions for nuclear security, in particular in the context of control over nuclear materials and the possibilities of their use, are considered. The results of the study of the problem are presented in the description of new threats and risks that require deepening cooperation of international partners and taking effective measures to ensure nuclear safety in the region. The study emphasises the need for joint efforts to counter new challenges and minimise nuclear safety risks. The practical significance of the study is determined by strategies for cooperation with international partners to achieve stability in the field of nuclear safety

**Keywords:** radiation safety; risks; nuclear weapons; nuclear facility; non-proliferation; geopolitics

## Introduction

Security challenges in the post-bipolar world have changed significantly. Although nuclear-related tensions between the superpowers have not reached the level of the Cold War, the existence of significant nuclear arsenals still creates a burdensome situation. The possibility of an accidental nuclear war or escalation of a non-nuclear conflict to the level of nuclear war cannot be ignored. The further proliferation of nuclear weapons and the possible lowering of the barrier to their use are particularly worrying. Russian threats to use nuclear weapons against Ukraine are a terrible example of this.

The current stage of development of the international nuclear non-proliferation regime is characterised by the existence of fundamental national security documents developed by the leading nuclear powers. For example, such documents are the U.S. 2022 National Security Strategy (Johnston, 2023) and the Global Britain strategy (Robinson *et al.*, 2021). Detailed assessments of new threats and challenges to the international nuclear non-proliferation regime are provided by organisations such as the Nuclear Threat Initiative (NTI) (NTI convenes largest global..., 2023) and the Stockholm International Peace Research Institute (SIPRI) (Fedchenko *et al.*, 2023).

Many researchers addressed the issue of nuclear and energy security in the world and Ukraine. B. Ostudimov (2021) points out the exceptional importance of doctrinal regulation of security issues in the world and in Ukraine in particular. In his opinion, the status of safety and sustainability can be ensured by guarantees of signatory countries that create international agreements on nuclear policy regulation.

Some researchers have presented a view on the peculiarities of the international legal regime of nuclear non-proliferation, outlining related issues related to the category of “exceptional circumstances”, which are referred to by a state party to the Treaty on the Non-Proliferation of Nuclear Weapons, NPT (1968), as a basis for termination of its participation in the Treaty (Okladnaya & Zal, 2020).

O. Reznikova (2022) examined the theoretical and practical aspects of ensuring national resilience in a changing and uncertain security environment. According to the researcher, nuclear safety is one of the key aspects of the country's resilience and security. L. Gunko and V. Zadorozhnyi (2021) analysed possible developments in the international situation in connection with the possible launch of Ukraine's nuclear weapons

programme and the inevitable consequences this will have in the international context.

Current research questions are formulated in the works of T. Melnyk and P. Sinovets (Melnyk, 2020; Melnyk & Sinovets, 2020). According to these scientists, current transformations in international security create nuclear uncertainties that affect the strategic stability of the world. Ukraine, as a country in a situation of conflict and hostilities, is becoming both an object and a subject of international security transformations, which significantly affects the status of nuclear balance and the threat of nuclear war.

The analysis of recent publications shows that scientific works do not sufficiently cover the current state of nuclear safety in Ukraine in the context of a full-scale Russian invasion. Therefore, the study aims to highlight the role of Ukraine as a key element of the European security system in terms of nuclear safety in the situation of hostilities with the aggressor country. The study analyses and highlights the main aspects and factors that affect Ukraine's nuclear safety and have a direct impact on the international security system, in particular, on the European countries.

The study's objectives include consideration of the historical context: coverage of Ukraine's transfer of its nuclear weapons materials to Russia following the Treaty on the Non-Proliferation of Nuclear Weapons; analysis of the current stage of development of the international nuclear non-proliferation regime and its impact on Ukraine's nuclear security; study of Ukraine's role in the context of the European security system, in particular, its impact on the Black Sea region; analysis of the consequences of military actions in Ukraine and their impact on nuclear security; identification of new threats and risks related to nuclear security. The study aims to emphasise the need for joint

efforts and cooperation of international partners to counter new challenges and minimise nuclear safety risks.

The problem under study has a complex nature, so a combination of general and special methods of cognition is used to study it. The main method is the system analysis, which is the methodological basis of the study and based on which the model developed by the author to study this issue is built.

One of the important tools of the research was the synergistic approach, which made it possible to reveal the peculiarities of the processes of self-organisation of complex nonlinear systems, considering the many active components that make up the European security system. The synergistic approach allowed us to study the interaction and interrelationships between these components and identify their synergistic effects.

Since the purpose and objectives of the study are interdisciplinary in nature, additional methods of a general logical nature were used to achieve them. In particular, analysis and synthesis, induction, and deduction, as well as the application of the principle of objectivity. These methods were used to identify and study the entire range of factors (subjective and objective, internal and external, global, and regional) and their interrelationships that determine the role of nuclear safety in the European security system. These methods allowed us to create the most objective picture model of the existing system.

Comparative and historical analysis, critical analysis, formal legal analysis, and contextual analysis were also applied. These methods allowed us to explore and evaluate various aspects of the process, considering its historical context, political aspects, legal aspects and contextual relations.

### ***Historical and political context of nuclear safety in Ukraine***

Ukraine is currently at a difficult stage of its development after gaining independence. The country is at war due to the aggression of the Russian Federation, which led to the introduction of martial law. Ensuring international security under martial law becomes the main goal of constitutional and legal regulation to protect and preserve human rights. In times of crisis, the priority of human rights is an important indicator of the level of democracy in a country and indicates the recognition of citizens as the highest social value.

Ukraine's nuclear security is a key element of the European security system due to several important factors. First, Ukraine is a security risk state, as it is, on the one hand, a neighbour of countries with nuclear weapons, and, on the other hand, located in a conflict area, which could pose a threat to its security (Ministry of Energy of Ukraine, n. d.).

Analysing the historical and political context, it is important to note that Ukraine, having gained independence in 1991, played an important role in ensuring nuclear safety in the post-Soviet space. At that time, Ukraine was the third largest nuclear power in the world, but for several legal and technical reasons, it was forced to give up its nuclear arsenal. Ukraine took this step by signing an agreement with Russia and the United States that guaranteed the country's security status. This agreement provided for the surrender of Ukraine's nuclear weapons for destruction and international assistance and support for the transition period. This process of nuclear surrender was complex and required significant efforts on the part of Ukraine. However, as a result of these agreements and cooperation with international partners, Ukraine ensured its nuclear safety and contributed to the overall reduction

of nuclear potential in the world (Law of Ukraine No. 248/94-VR..., 1994).

Ukraine was one of the founding signatories of the Memorandum on Security Assurances in Connection with Ukraine's Accession to the Treaty on the Non-Proliferation of nuclear weapons (1994). According to the Budapest Memorandum, Britain, Russia, and the United States pledged to defend the sovereignty and territorial integrity of Ukraine, which had renounced its nuclear weapons (Redko, 2022). Ukraine has also signed the Rome Statute of the International Criminal Court (1998), which obliges states parties to ensure respect for human rights and international humanitarian law. This increases the importance of Ukraine's nuclear safety, as nuclear safety is linked to ensuring security and protecting human rights (Zhakun, 2022). One cannot but agree with the analysts' opinion that the country, which is located at the intersection between Russia and the European Union, plays an important geopolitical role. Therefore, Ukraine had a strategic vector of development aimed at international and political balance and security (Melnyk, 2020). Given the threat of proliferation of nuclear weapons and materials from Russia to terrorist groups, Ukraine has a responsibility to ensure the security of nuclear facilities on its territory and should contribute to solving global security problems (Law of Ukraine No. 39/95-VR..., 1995).

Nuclear safety researchers (Gunko & Zadorozhnyi, 2021) emphasise that the conflict in Donbas and the illegal occupation of Crimea have significantly increased attention to Ukraine's nuclear safety. Russia is putting forward plans to restore its nuclear potential in the occupied territory of Crimea and is actively defending its interests in the region. This may lead to an aggravation of the situation in Europe and create new challenges in the field of nuclear safety.

### ***Ukraine's nuclear security in the context of the war***

Russia's military aggression against Ukraine in 2022, including attacks on nuclear facilities, has posed serious challenges to the world in the field of nuclear safety and security. These events not only have a significant impact on international nuclear safety but also require revision of national policies and safety regimes for nuclear facilities in Ukraine and other countries of the Black Sea region. Until 2014, the nuclear safety situation in Ukraine was similar to that in neighbouring countries. However, with the annexation of Crimea by Russia, military actions in the east of Ukraine and the creation of the so-called Donetsk and Luhansk People's Republics, the security situation in the country has undergone significant changes. This has led to the need for political and administrative reforms, including in the field of nuclear safety, to counter new threats, including internal and potential attacks on nuclear facilities. In this regard, Ukraine was forced to pay considerable attention to the protection of its nuclear facilities.

One of the main documents related to the nuclear security regime is the Convention on the Physical Protection of Nuclear Material (1979) as amended in 2005. The main idea of this convention is that the physical protection of the country should be based on the assessment of current threats to the state. According to the International Atomic Energy Agency, IAEA (2009) Nuclear Security Guidelines, the threat assessment should be a document known as the Design Basis Threat (DBT), which includes a comprehensive description of the motivation, intentions, and capabilities of potential adversaries, which is considered when developing and evaluating defence systems (Manuilova, 2020; Ivanytskyi, 2023). The DBT concept is widely used around the world and is discussed in numerous IAEA nuclear safety documents, including a series

of documents published in 2009 and updated in 2021. Nuclear facility operators have the primary responsibility to protect against the threats identified in the DBT, while the state has the primary responsibility to protect against threats that exceed the DBT but are less than the "maximum threat capability". It is important to note that threats with capabilities exceeding the "maximum threat capabilities" (e.g., foreign military attack) are not covered by nuclear safety documents (Resolution of the Cabinet of Ministers of Ukraine No. 824..., 2013; Shevchenko, 2022).

The study of nuclear safety in the context of military operations showed that the events of 2014 led to changes in the threat environment for nuclear safety in Ukraine in several directions. First, these events highlighted internal threats. Previously, physical protection of nuclear facilities was the responsibility of the Internal Troops of Ukraine, which were subordinated to the Ministry of Internal Affairs. However, as a result of the annexation of Crimea to Russia, one of the units responsible for the physical protection of facilities in Crimea fell under Russian control. These events forced Ukraine to review its national security measures and create internal Ukrainian forces independent of Russian influence. To this end, the National Guard was created in March 2014, with the responsibility to protect critical infrastructure, including nuclear facilities, nuclear material, radioactive sources, and nuclear waste (Vashchenko *et al.*, 2021).

Secondly, the loss of control over Crimea and the eastern part of the country has created new risks of illicit nuclear trafficking. Along with the loss of territory, the nuclear safety infrastructure, in particular in seaports and on the borders of Ukraine, disappeared. The possibility of training on nuclear safety and control over radioactive materials and orphan sources that remained in

the territories controlled by the so-called DPR and LPR has also been lost.

Thirdly, two known threats related to attacks on nuclear facilities were discussed at the time. One of them is a potential attack by armed groups with heavy weapons on a nuclear power plant in Ukraine with the aim of proliferation of radioactive material. This threat was identified due to the presence of heavy weapons, including tactical missile systems, in the hands of separatists in eastern Ukraine. In particular, Zaporizhzhya NPP, the largest nuclear power plant in Europe, was specifically identified as a potential target for these weapons, which was achieved during the Russian aggression against Ukraine in 2022. Another risk situation was the possible downing of an aircraft in the vicinity or on the territory of a nuclear power plant. This threat became particularly relevant after the downing of the Malaysia Airlines plane on 17 July 2014 as a result of a missile attack launched from separatist-controlled territory in Ukraine (Manuilova, 2018; Global Nuclear Community..., 2022).

According to the analysis of scientific sources (Manuilova, 2020; Shymanska, 2020), in 2015 and later, Ukraine followed the IAEA recommendations by updating and revising its core document for nuclear facilities, nuclear material, radioactive waste and other radioactive sources to consider changes in the threat environment. These updates

have focused on the risks mentioned earlier. However, starting in 2022, as a result of Russia's large-scale invasion of Ukraine and the subsequent war and occupation, hazards and threats have emerged that significantly exceed the risks discussed earlier.

### ***New nuclear safety challenges after 24 February 2022***

Since the outbreak of hostilities on 24 February 2022, the IAEA has played an important role in providing timely safety information to all nuclear facilities in Ukraine. The State Nuclear Regulatory and Control Inspectorate of Ukraine, which acts as the national competent authority under the Convention on the Early Notification of a Nuclear Accident (1986), maintains direct communication with the Emergency Response Manager of the IAEA's Events and Emergencies Centre.

The IAEA actively publishes a significant part of the information received from Ukraine, including data on its actions and relevant information provided by other countries. This contributes to strengthening the IAEA's role as an international defender of nuclear safety, providing safeguards in the context of the situation in Ukraine, as well as during multiple attacks on nuclear facilities. The attacks on nuclear facilities in Ukraine recorded by the IAEA can be classified into the types shown in Table 1.

**Table 1.** Classification of IAEA-recorded attacks on nuclear facilities in Ukraine

| Type 1                                                                                                                                                                                   | Type 2                                                                                                                                                                                          | Type 3                                                                                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Physical damage to nuclear facilities: shelling, missile attacks or other military actions that damage the infrastructure of nuclear facilities and may pose a threat to nuclear safety. | Damage to power lines and power outages: attacks on power lines supplying nuclear facilities, causing problems with power supply, resulting in a reduction in the safety of nuclear facilities. | Military occupation or annexation: a hostile force invading and taking control of or occupying nuclear facilities. This can pose serious threats to nuclear safety and require immediate countermeasures. |

**Source:** developed by the author based on NTI data (NTI convenes largest global..., 2023)

During emergencies, the responsibility for countering threats is shared among national nuclear security actors. So far, there has been limited discussion of nuclear security responsibilities in emergencies in the IAEA and many of its Member States. The contribution of Ukrainian officials specialising in nuclear safety issues to the discussion of actions and responsibilities of actors in the event of an emergency is crucial. The experts offered recommendations and their views based on their own experience. These proposals may be valuable for further discussions (Risk of nuclear weapons..., 2023).

A review of the recommendations of nuclear safety experts showed the importance of developing a set of regulatory documents and operational guidelines that would describe the safety responsibilities of nuclear facility operators and the measures to be taken in emergencies, including threats beyond the Design Basis Threat (DBT). According to them, the lack of previous experience and the absence of such operational protocols describing the operation of safety systems and facilities during emergencies outside the DBT posed a serious problem for Ukraine (NTI convenes largest global..., 2023). Officials emphasised the need to consider various aspects when developing the proposed documents. These aspects included the limits of safe operation of nuclear facilities under threat, emergency preparedness, monitoring of radiation levels, availability of sufficient material reserves for reliable operation, availability of diesel fuel and mobile power supplies, and staff work and rotation opportunities (April 2023 Global Dialogue, 2023; Nuclear safety in Europe, n.d.).

The development of a schedule for staff to operate in emergency circumstances is likely to address the need to minimise the number of employees at a nuclear facility, balancing the need for safe operation of nuclear facilities with the need

to ensure personal safety and evacuation of personnel. However, it is unclear how such protocols can define the actions of personnel at nuclear facilities during an occupation. Holding personnel accountable in such circumstances becomes a difficult task, although their behaviour must comply with international humanitarian law.

Ukrainian officials participating in the discussion proposed the development of an international guidance document, possibly within the framework of the IAEA Nuclear Safety Session or a similar format. This document should address the national nuclear security regime in the face of threats beyond the DBT. The development of such guidelines should address the issue of coordination between the authorities responsible for the legal operation of the facility and the occupying power, which may not have internationally recognised rights to operate the facility but has the physical ability to do so (Reznikova, 2022).

It is important to note that Ukrainian officials who participated in the April 2023 Global Dialogue (2023) expressed concern about the cooperation of international organisations, in particular the IAEA, with the occupation authorities on urgent nuclear safety issues. This may result in unforeseen recognition of the occupying authorities' territorial claims.

Experts interviewed believe that existing plans to protect personnel and the public in the event of a radiation accident at a nuclear power plant caused by a threat outside the DBT need to be strengthened or revised (NTI convenes largest global dialogue..., 2023). They propose to improve the reliability, automation and autonomous operation of technical systems that monitor the level of radioactivity around nuclear facilities, including nuclear power plants, as well as communication channels. The ideal situation would be if radioactivity monitoring systems could transmit data



to the regulatory authority or the relevant institution without the involvement of plant personnel who may be under attack or captured. It is worth developing redundant logistical arrangements and stockpiling diesel fuel and spare components in case normal logistical routes are unavailable. It is also important to consider creating additional evacuation routes for power plant personnel (NTI convenes largest global dialogue..., 2023).

The events that began in Ukraine in 2014 significantly changed the nuclear security challenges for the countries of the Black Sea region, except Ukraine itself, and at the same time limited the possibilities for regional cooperation in this area. The region continued to face serious nuclear security challenges, the main ones being the management and control of nuclear materials, other radioactive substances, orphan sources, and insufficiently secure radioactive waste storage. The region has also become a route for illicit nuclear trafficking and a haven for smugglers. None of the nuclear security experts surveyed by the Stockholm International Research Institute in 2022 (Coles *et al.*, 2023) denied the importance of combating the smuggling of radioactive materials. However, most of them pointed out that insufficiently secure storage of radioactive waste and smuggling of abandoned radioactive sources are more urgent problems.

The Russian military aggression in Ukraine in 2022 and attacks on nuclear facilities not only exacerbated existing problems in the Black Sea states but also changed the perception of threats in several important aspects (Kosharna, 2023; Ukraine: Russia-Ukraine war..., 2023; IAEA Director General statement..., 2023). This conflict is the first time that a functioning nuclear power plant has been the direct target of a military attack and occupation.

Recent research conducted by the Royal United Services Institute (RUSI) focuses on the

risks to nuclear power plants in Ukraine, including the potential radiological hazards posed by the Russian invasion and occupation of the nuclear power plants in Chornobyl and Zaporizhzhia (Ukraine: Russia-Ukraine war..., 2023).

Although penetration of a reactor or spent fuel storage facility through a military strike is unlikely in the current situation with military operations around Ukrainian nuclear facilities, an accident or deliberate event could occur through an attack on the infrastructure that supports the operation of a nuclear power plant, including water and electricity supply systems. The likelihood of a Chornobyl-like disaster is low, but an accident similar to the one at Fukushima in 2011 is possible.

There are currently no indications that Russia is planning to launch strikes targeting Ukraine's nuclear power plants, although Moscow may have considered nuclear sabotage in Ukraine. The report also examines how Russian military forces might respond if Ukrainian forces successfully breached Russian defensive positions in Zaporizhzhia, which could include attempts to provoke a radiological event by Russia. This follows reports from the UK Ministry of Defence that Russian forces have established sandbagged fighting positions on the roofs of several of the six reactor buildings at the Zaporizhzhia nuclear power plant.

Although the current situation in Ukraine is the first time that an operational nuclear power plant has been under fire or occupied by a foreign military force, several modern NPPs are located in areas prone to conventional military conflicts, raising questions about the risks these facilities may face in the future. As the international community seeks to transition to a sustainable energy source and achieve zero carbon emissions by 2050 (International Energy Agency, 2021), the



role of nuclear energy in the world, and thus the number of NPPs, is likely to increase.

### **Conclusions**

The historical context of Ukraine's nuclear security is analysed. Following the Treaty on the Non-Proliferation of nuclear weapons, Ukraine voluntarily renounced its nuclear status by transferring its nuclear weapons materials to Russia. This decision contributed to maintaining nuclear safety in the region and promoted cooperation with international partners. Ukraine pays great attention to nuclear safety and actively cooperates with international organisations such as the IAEA and the EAEU. The country adheres to international standards and commitments in the field of nuclear safety.

The analysis of the consequences of military actions in Ukraine and their impact on nuclear safety has shown that the nuclear safety regime should develop practical guidelines at the operational level, known as "emergency protocols". These protocols define the actions and responsibilities of facility operators in emergency circumstances, including armed conflict. The development of such emergency protocols may be based on documents and guidance provided by the IAEA, but their implementation and compliance are the responsibility of each State. The main objective of emergency protocols is not only to achieve nuclear safety and radiation protection but also to ensure that these objectives are met by international humanitarian law.

Overall, the nuclear safety of Ukraine is not only a national priority but also an important element of the European security system. Ukraine fulfils its obligations to the international community, actively cooperates with international organisations and takes measures to ensure the safety of its nuclear potential. However, due to the

complexity of the geopolitical situation in the region, it is important to continue to focus on nuclear safety issues and take the necessary measures to maintain stability and security. Further scientific research should be devoted to legal regulation of these issues and finding ways to reduce the level of potential threat to Ukraine and Europe as a whole.

The study is distinguished by a comprehensive analysis of Ukraine's nuclear security. It does not limit itself to technical issues only but also addresses the geopolitical, social, and international factors that affect this important aspect of security. Given the general interest and importance of nuclear security, there are numerous interesting areas for further research. For example, research in the field of automated safety of nuclear facilities. With the development of artificial intelligence and automation technologies, it is possible to consider methods and systems that improve the safety of nuclear facilities and help prevent possible accidents. The second area is the study of the interaction between nuclear energy and climate change. Understanding the impact of nuclear energy on climate change and developing strategies to reduce CO<sub>2</sub> emissions from nuclear power may be key to energy sustainability and the fight against global warming. The third area includes research into new technologies and designs for next-generation nuclear reactors to improve their safety and efficiency. This may include the use of small reactors, fusion reactors, or innovative coolants.

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### ***Conflict of Interest***

None.

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## Ядерна безпека України як ключовий елемент європейської системи безпеки

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### Анотація

Україна як стратегічно розташована територія та важливий гравець у геополітичних інтересах різних силових блоків стала ключовим елементом європейської системи ядерної безпеки, тому актуально дослідити найважливіші чинники, що формують ситуацію навколо ядерної зброї, та вжити відповідних заходів для уникнення потенційних загроз. Основна мета дослідження – окреслити всі аспекти та фактори ядерної безпеки України, які безпосередньо впливають на систему міжнародної безпеки, зокрема країн Європи. Методологічна основа дослідження – системний аналіз інформаційних та нормативно-правових джерел, як-от: двосторонні та багатосторонні міжнародні угоди, документи й матеріали міжнародних організацій, документи органів влади окремих країн, промови, матеріали друкованих та електронних засобів масової інформації. У статті висвітлено історичний контекст, зокрема передачу українських ядерних збройних матеріалів Росії відповідно до Договору про нерозповсюдження ядерної зброї. Проаналізовано сучасний етап розвитку міжнародного режиму нерозповсюдження ядерної зброї. Звернено увагу на еволюцію режиму під впливом конфронтації двох супердержав та доктрини взаємного стримування. З'ясовано ситуацію з ядерною безпекою в Україні та її вплив на регіон Чорного моря. Розглянуто наслідки військових дій в Україні та фактори, що створюють нові виміри для ядерної безпеки, зокрема у контексті контролю над ядерними матеріалами та можливостей їх використання. Результати дослідження проблеми представлено в описі нових загроз і ризиків, що вимагають поглиблення співпраці міжнародних партнерів та вжиття ефективних заходів для гарантування ядерної безпеки в регіоні. Дослідження підкреслює необхідність спільних зусиль для протидії новим викликам та мінімізації ризиків, що пов'язані з ядерною безпекою. Практичне значення роботи полягає в розробці стратегій співпраці з міжнародними партнерами з метою досягнення стабільності у сфері ядерної безпеки

**Ключові слова:** радіаційна безпека; ризики; ядерна зброя; ядерний об'єкт; нерозповсюдження зброї; геополітика

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