ROMANIAN MILITARY THINKING

NUCLEAR AND RADIOLOGICAL TERRORISM: THREATS TO (INTER) NATIONAL SECURITY

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The study presents a general perspective on the evolution of the weapons of mass destruction. The atomic bomb, which emerged in the context of the Second World War, ceased to be, shortly, the monopoly of a single power. There are two known cases of atomic bombings – on Hiroshima and Nagasaki –, which resulted in Japan's exiting the second world conflagration.

Nuclear bombs have never been used since then, which is explained by the fact that the great powers have realized that the implementation of these weapons would lead to a planetary disaster in which they would have no strength to gain. The tendency of a terrorist organization to seize nuclear bombs further jeopardizes international security.

In the context of the outbreak of the Russian-Ukrainian war in February 2022, a unique situation in history occurred, when foreign armed forces occupied a nuclear power plant, thus threatening the entire global security system.

Keywords: terrorism; nuclear weapons; Ukraine; radiology; Russian Federation;

HISTORICAL MILESTONES

Terrorism continues to be one of the great scourges of contemporaneity. The aim of terrorism is to generate states of intimidation, anxiety, neutralization, and assassination (Văduva, 2002, p. 4), regardless of its physiognomy (informational, media, cyber, financial, religious etc.). Nuclear and radiological terrorism represents one of the recurring global problems. It poses a direct and indirect threat to most of the Earth, resulting in inherent consequences in all areas.

Humanity experienced a new phase of threats that was previously unknown to history in the middle of the 20th century. We are talking about weapons of mass destruction, the use of atomic bombs, equipped with a device that releases in an explosive manner the nuclear energy formed by fissile materials (plutonium, uranium) and triggers a chain reaction, uncontrolled and manifested by a large amount of heat and radioactive dust, thus producing great material and human destruction. The first controlled nuclear fission experiment took place in December 1942. In August 1944, the *"Manhattan Project"* started producing nuclear weapons in Los Alamos, New Mexico. It took a year to complete and two million dollars were invested. The USA had three atomic bombs designed and produced by a mix of Anglo-American-Canadian teams.

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The first atomic bomb was tested on 26 July 1945, at Alamogordo (New Mexico, USA). The other two bombs were used to force the Japanese to capitulate in the Second World War, not knowing that other bombs did not actually exist. On 6 and 9 August 1945, atomic bombs were dropped on Hiroshima and Nagasaki, which worked through uranium fission, plutonium being used only subsequently. The two weapons of mass destruction killed 150,000 people and more suffered from radiation. It prompted Japan's exiting the war, which led to the completion of the second world conflagration.

The atomic bomb has become a force reality for the superpowers of the world. On 11 June 1945, James Franck, Nobel Prize laureate

in Physics (1925), warned US authorities that the USA atomic monopoly could last only a few years and was in favour of avoiding the use of the bomb against Japan. The USA lost the monopoly of the atomic bomb in 1949 when the USSR created its own weapon of mass destruction. On 3 October 1952, Britain detonated the first atomic bomb in Australian waters. France has owned atomic bomb since 1960, and China since 1964. Subsequently, India (1974), Pakistan (1998), Israel and North Korea (2006) also became nuclear powers.

The hydrogen bomb is an even more powerful nuclear weapon than the atomic one. It was first obtained by the United States of America in 1952 as a weapon of mass destruction created by the nuclear fusion of hydrogen isotopes. It soon came into possession of the USSR (1953), United Kingdom (1957), China (1967), and France (1968). It was never used during the Cold War, but it became a symbol of the apocalypse. Another element of the total disaster became the neutron bomb, a weapon with increased radiation. The power of this bomb is that it kills people, leaving the buildings untouched. In 1977, the USA obtained a more powerful weapon, the hydrogen bomb with beryl, which increases radioactive power. In the mid-80s, the Soviet nuclear arsenal was double that of the USA.

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The disaster at Chernobyl (Ukraine today, then part of the Soviet Union) Nuclear Power Plant, on 26 April 1986, brought a major change in the public's perception of the major consequences of Europe's most disastrous ecological calamity in the history of nuclear power generation, being estimated at the highest level – the seventh. The amount of radioactive material spread in the atmosphere was 200 times higher than that of Hiroshima and Nagasaki (Xenofontov, 2011, pp. 70-71; Bandi, 2023, pp. 94-103).

The nuclear bomb prefigured the political situation during the Cold War. The consequences that the nuclear weapon could have triggered were the main barrier that stopped the decision-maker from implementing them. It was realized that activating the weapon of mass destruction would not create the victorious and defeated dichotomy, but would set up a disastrous scenario for all mankind.

At the end of the Cold War, the United States of America and the Russian Federation, which had the largest number of nuclear warheads, worked together to remove and secure the remaining nuclear weapons in the former Soviet territory. According to researcher Eliza Gheorghe,

the major powers (USA, Russian Federation and China) tended to stop nuclear proliferation by limiting transfers and fixing safeguards on nuclear technologies. This activity has been marked by two structural factors: *the overall distribution of power* and *the intensity of the security rivalry between them*. The more intense the rivalry between the major powers in the bipolar and multipolar system is, the less effective the limitation of proliferation could be (Moniz, 2023, pp. 5-6; Gheorghe, 2019, pp. 88-127).

THE ISSUE OF PROPER ADMINISTRATION AND USE OF NUCLEAR PRODUCTS

The pressing problems facing the world's states lie in the proper administration and use of nuclear products. Similarly, it is important to combat nuclear terrorism, illicit trafficking of nuclear materials by strengthening an international nuclear safety insurance structure.

From a technological perspective, the creation of a nuclear bomb is a difficult problem for terrorist groups, but not an impossible one. Between 1990 and 2010, 18 cases of nuclear material theft were known. Several attempts by the al-Qaeda terrorist organization to acquire nuclear material or nuclear expertise were found (RRA, 2010). A threat to global security is the possession of nuclear products by terrorist organizations such as the Islamic State. Currently, nuclear security threats are intensifying – from theft and sabotage to powerful storms, fuelled by climate change, political instability and war, thus emphasizing the need to protect nuclear facilities and materials in the world.

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The 2016 Nuclear Threat Initiative (NTI) report considers Pakistan, India, Israel, Iran and North Korea as states with poor nuclear material safety and high sabotage attempts. The 2023 NTI index reveals a number of worrying problems related to the evolution of events. States and areas with nuclear materials for military purposes and nuclear installations had made almost no progress since 2020 towards improving the security culture and preventing threats from within; plutonium stocks in civilian nuclear power plants that could be used for military purposes had increased rapidly; in 34% of the countries and areas with nuclear facilities there were no regulatory requirements in place to protect nuclear infrastructure in the event of a natural or man-made disaster; in the same countries and areas, the support

for political and legal measures to improve security was declining; minimal progress had been made in securing radioactive sources against those that could steal them to build dirty radioactive bombs (Moniz, p. 6).

NUCLEAR WEAPONS POSSESSORS: CURRENT STATE

If, at the end of the 80s, more than 50,000 nuclear warheads were accumulated on Earth, in 2023, according to the international organization *Nuclear Threat Initiative/NTI*[1], it was found that the number of nuclear weapons in the world was 13,100 (https://www.nti.org/area/nuclear/).

At the beginning of 2024 it was estimated that the nine nuclear states (USA, Russian Federation, United Kingdom, France, China, India, Pakistan, North Korea and Israel) jointly owned 12,121 nuclear weapons, of which 9,585 were considered to be on high alert; 3,904 of those warheads were active, including about 2,100 on high alert.

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From a quantitative perspective, there is a reduction in the number of nuclear warheads in the world. It is due to the fact that the USA and the Russian Federation initiated an extensive process of dismantling end-of-life nuclear warheads. From a qualitative point of view, however, we note that both the USA and the Russian Federation are undertaking extensive and expensive actions to replace and modernize nuclear warheads, systems for launching missiles, aircraft and submarines, as well as nuclear weapons production facilities. China's nuclear weapons arsenal is expected to continue to grow over the next decade. China will have more intercontinental ballistic weapons than Russia or the USA. However, China's total stockpile of nuclear warheads is still much lower than that of Russia or the USA. China currently has 410 nuclear weapons. Similarly, India, Pakistan, the United Kingdom tend to increase their nuclear weapons stockpiles. North Korea's

[1] The *Nuclear Threat Initiative/NTI* is a global nonprofit security organization focused on reducing nuclear and biological threats that are endangering humanity (A.N.).

nuclear program remains a pillar of its nuclear policy. In 2022, North Korea conducted more than 90 ballistic missile tests, the highest rate of testing in a single year. Israel maintains its policy of *"nuclear ambiguity"* by not disclosing the exact number and characteristics of its nuclear weapons (Sipri Yearbook, pp. 12-13).

DIALOGUES ON STRATEGIC NUCLEAR SAFETY ISSUES

From an institutional perspective, international organisations in the field are expected to respond to global challenges to nuclear safety. International Atomic Energy Agency (IAEA), established in 1957 (Thomas, 2002, p. 27), is the leading global institution with the mission to prevent nuclear proliferation and aims to initiate actions to prevent nuclear threats to humanity. Unfortunately, in recent years, it has been a reduction in support for the role played by the IAEA in strengthening the global framework for nuclear safety and security. To meet global challenges of managing threats on the nuclear terrorism dimension, the UN has initiated a number of conventions in the field.

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Periodically, on the agenda of international fora, the subject of nuclear safety becomes a recurrent one. During the Barack Obama administration, starting in 2010, once every two years, it was organized the nuclear security summit *"A world without nuclear weapons"*. The meetings were also marked by a series of interstate communication incidents. At the first edition of the summit, Israeli Prime Minister, Benjamin Netanyahu, upset by the fact that the question of his country's suspected nuclear arsenal was to be addressed, decided not to attend the forum (RRA, 2010). In spring 2016, representatives of 53 states met in Washington at the nuclear safety summit. It is worth mentioning that the meeting was not attended by all the states that possess nuclear weapons, such as the Russian Federation and Pakistan. The former president of Romania, Klaus Iohannis, was present to the meeting. In his speech, he put a special emphasis on the security architecture of the Black Sea and announced Romania's commitments on this subject as follows: *"strengthening national capabilities for nuclear forensic investigations; improving the safety of nuclear and radioactive materials transport by implementing a pilot system for tracing the circulation and transport of radioactive sources; development and implementation of a national training course on nuclear safety culture; new voluntary contribution to the Nuclear Security Fund of the International Atomic*

Energy Agency" (CECCAR, 2016). At the same time, former head of the Romanian state wanted to specify that Romania is part of the *"limited system of states with relevant nuclear capabilities, possessing the entire nuclear fuel cycle"* (Ib.).

The importance of arms control agreements and commitments was stated at the beginning of 2022, in a joint statement by the leaders of the five permanent members of the UN Security Council (China, France, Russian Federation, United Kingdom and USA/Group 5) *"on the prevention of nuclear war and the avoidance of an arms race"*. On 3 January 2022, the five permanent members of the UN Security Council issued a joint statement on the need to prevent nuclear war. Following the invasion of February 2022, by one of the nuclear powers – the Russian Federation – over the neighbouring state – Ukraine –, a country devoid of weapons of mass destruction, it was a substantial setback in bi-and multilateral cooperation on nuclear arms control. By the end of 2022, dialogue in Group 5 countries was suspended and the communication process was limited to expert-level contacts.

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In August 2022, the international community failed to reach an agreement at the tenth conference revising the 1968 Treaty on the Non-Proliferation of Nuclear Weapons (NPT). The lack of consensus was largely attributed to the position taken by the Russian Federation. As two consecutive review conferences ended without consensus results or recommendations, the parties agreed to set up a working group to further strengthen the process of revising the nuclear Non-Proliferation Treaty before the planned conference for 2026.

NUCLEAR SECURITY IN EASTERN EUROPE AREAL

A sensitive issue of nuclear security is the eastern European space, marked by corruption, pauperization, democratic fragility, an area estimated to be one of the most vulnerable to organized crime networks, including illicit trafficking in nuclear materials and radiological sources. These vulnerabilities are intensified by the escalation of the war in Ukraine and the maintenance of the separatist regime on the left bank of the Dniester.

According to the Budapest Memorandum of December 1994, Ukraine gave up its nuclear armament inherited from the Soviet Union, estimated to be the world's third nuclear arsenal. In exchange for signing the nuclear Non-Proliferation Treaty, the USA and the UK

offered the Ukrainian state guarantees on the security of borders. The Treaty led to the exit from international isolation of Ukraine, which was ranked third in receiving foreign aid from the USA, after Israel and Egypt. Although in 1996 the Russo-Ukrainian Treaty of Friendship was signed, guaranteeing the territorial integrity of Ukraine, the Russian Federation has flagrantly violated these commitments (Plokhy, 2018, pp. 360-361). In the context of the large-scale Russian-Ukrainian war started on 24 February 2022, the Russian armed forces put under real threat the nuclear power plants in Ukraine, implicitly, endangering the entire region with a potentially devastating radiological leak.

On 4 March 2022, the world remained appalled by the fact that the Russian armed forces occupied the nuclear power plants Zaporizhzhia and Chernobyl in Ukraine. The Russian forces fired shells with powerful explosives around the Zaporizhzhia nuclear power plant, causing a plant explosion with a loss of off-site power supply. Thus, it had to rely on short-term emergency diesel generators to cool the reactors and spent fuel. Russian forces also physically and psychologically abused the Zaporizhzhia and Chernobyl personnel, degrading their ability to operate nuclear facilities safely.

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The Russian Federation tended to use Ukrainian nuclear power plants as shelters for human resources, ammunition and for creating command posts for its troops. Similarly, it relied on controlling 60% of Ukraine's electricity production, thus directly influencing the economy of this state. The Kremlin resorted to blackmailing European states with possible radioactive leaks, to discourage their support of Ukraine (Nițulescu). It should be noted that Zaporizhzhia is included by the Russian Federation in the plan of secession of Ukraine in the buffer state of Novorossiya, a recital that would have allowed Russians to have access to land in Crimea and the districts to the left of the Dniester (Plokhy, p. 378). Currently, the nuclear power plant in Ukraine no longer produces electricity, being a military base of Russian troops.

For the authorities and personnel of nuclear facilities in Ukraine, the war has created unprecedented challenges in terms of nuclear safety and safeguards. Never before have nuclear power stations been

subjected to artillery or missile bombardments from a belligerent state or occupied by military forces. It was a situation few had anticipated, because nuclear facilities were not designed to defend against armed intervention or to operate safely in a war zone. The military conflict has undermined nuclear safety and security in a number of ways, from undermining the security culture to introducing threats from a nuclear facility (The NTI Nuclear Security Index 2023, p. 42).

On 6 October 2022, the then-President Joe Biden, warned world public opinion on a *"Armageddon"* as a result of the Russian Federation's use of nuclear weapons in Ukraine. Against the background of the escalation of the Russian-Ukrainian war, the IAEA organized several missions of technical experts for Ukraine, establishing, on 13 December 2022, a permanent structure of nuclear safety experts at all four nuclear power plants in Ukraine. The IAEA also proposed a conceptual framework of *"seven indispensable components of nuclear safety"* to address threats to nuclear installations in wartime (Sipri Yearbook, pp. 14, 23).

Insecurity actions at nuclear stations in Ukraine, followed by domestic events in Russia, have raised alarm signals about the control of central authorities over the nuclear arsenal.

A fierce blow to the ecosystem of multilateral nuclear security institutions was delivered in 2022, when the global initiative to combat nuclear terrorism was suspended due to the invasion of the Russian Federation into Ukraine.

CONCLUSIONS

It is a fundamental reality that the neglect of nuclear risks in any state or area endangers global safety. A single act of nuclear terrorism would have devastating consequences from a political, economic and humanitarian perspective, which would reverberate around the world. It would also undermine civil nuclear energy and its important role in mitigating global climate change.

In this respect, it is imperative that the major powers should organize new global or regional initiatives focused on reducing the risk of sabotage or nuclear theft.

As I have mentioned in this approach, a fierce blow to the ecosystem of multilateral nuclear security institutions was delivered in 2022, when the global initiative to combat nuclear terrorism was suspended due to the invasion of the Russian Federation into Ukraine.

Thus, in the context of the large-scale escalation of the Russian-Ukrainian war started on 24 February 2022, states of anguish about the intensification of the military conflict up to the onset of a nuclear conflagration are activated.

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