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THE CURRENT OPERATIONAL ENVIRONMENT FROM THE PERSPECTIVE OF CBRN HAZARDS

In the current context, the most prominent menace to global security prevails, the same it was 50 years ago, the feasibility of using the nuclear arsenal. This arsenal continues to be renewed, incorporating increasingly advanced technologies and state-of-the-art vectors capable of transporting these means at very high speeds and almost unlimited distances.

A significant feature of modern military conflicts is the multidimensional nature, specific to hybrid warfare. Unconventional hybrid threats should also consider the possible use of chemical, biological, radiological, and nuclear weapons of mass destruction (CBRN WMD) and the generation of destruction or sabotage incidents, which may result in contamination with toxic industrial materials (TIMs).

The current operational environment appears crystallized in a new, more refined, and sophisticated form of the Cold War, with two major classical strategic blocs, namely NATO and partner countries, on the one hand, and the Russian Federation as the opposite pole. The two great actors are not the only constituent elements of the current geostrategic ensemble. Added to this are the conflict in Syria, tensions in Israel and Palestine, the complicated US-Iran relationship over the last state's nuclear program, the volatility of the Kim Jong-un regime in North Korea and, last but not least, the rise of China and India as economic and military superpowers. In this study, we will detail the basics of international law in the possession, production, and use of CBRN agents, the declared arsenals of weapons of mass destruction of main world actors, and how CBRN agents had been used in recent conflicts.

***Keywords**: hybrid threats, CBRN weapons of mass destruction, toxic industial materials.*

Introduction

In recent years, we have seen a trend of reconsideration of the significance of the Arctic, both by the US and Canada, but especially by the Russian Federation. Thus, the Russian Federation has developed a set of regulations on the notification 45 days in advance of the crossing by warships belonging to other states of the Northern Maritime Route and the presence on board of authorized Russian pilots. The Northern Sea Route (NSR) connects Western European ports in the North Sea or the Russian Sea, such as Murmansk or Arkhangelsk, with the Bering Strait and stretches along the entire northern Russian coast. Moreover, Russia has expanded its infrastructure and presence in the Arctic from a military point of view, in order to control the North Seaway area better and to strengthen the security of its national territory.

For a better perception of the current geostrategic situation in the Arctic, it is necessary to display, from a historical point of view, the evolution of this area's security situation. First of all, it should be mentioned that the northern part of the Russian Federation, located in the vicinity of NSR, is very rich in natural resources.

Problem statement. The current security environment is defined by a kaleidoscope of hazards, risks, and threats which define the hybrid nature of conflicts, especially concerning those taking place in Eastern and South-Eastern Europe. These hazards, risks and threats incorporate - in addition to those of a conventional and irregular nature - those of an unconventional variety, including chemical, biological, radiological, and nuclear weapons of mass destruction and similarly toxic industrial materials.

Analysis of recent research and publications. The scientific reports and papers that the author recently studied revealed that although there have been multiple significant CBRN incidents recently - with extraordinary strategic implications - there is a tendency to diminish their importance in the economy of military conflicts. From our point of view, special attention must be paid to these hazards, which have shown that humanity is far from eradicating them, primarily when we refer to the nuclear arsenal, which has seen a revival of warhead vectors. The trend shows us that most plausible, they will be used in the tactical field to counterbalance for the lack of strength of the main actors with a global vocation, to which our country can join in the context of alliance or coalition.

The aim of the article. This study highlights the fact that, in the current security context, chemical, biological, radiological, and nuclear hazards still exist, despite the extraordinary efforts made by international bodies to eradicate them. These dangers with disastrous effects on military and civilian personnel, as well as on the environment, and which call into question the very existence of life on earth, must be taken into account in the planning of military operations so that the forces can carry out its missions even in the worst possible case, that of using CBRN WMD. This desideratum is only possible by

apprehending the CBRN threats and understanding the destructive potential of these weapons.

Statement of the main material

Challenges in the current operational environment and the tendencies of manifestation of modern military conflicts.

Since the Cold War, the former USSR's administration has ordered the location of airbases, radar stations, and anti-aircraft batteries to defend the northern shores of the USSR. The Arctic in the vicinity of the North Pole, northern Canada, and the US state of Alaska and the Bering Sea, between 1961 and 1991, witnessed continuous probing and interception of US and Soviet submarines, the US and Canadian air force aircraft on the one hand and the Soviets on the other. Since the shortest route, both for strategic bombing aircraft and the continental missiles between the USA and Russia is above the North Pole, and the two states tried to place detection equipment and air bases as far north as possible. Thus, the USSR managed to build an airbase on the island of Graham Bell in the Franz Joseph Archipelago, the northernmost military runway in the USSR, located only 896 kilometers south of the North Pole. The history of this airbase summarizes very well the past and present the geopolitical situation of the Arctic. It presents the desire to reaffirm itself as a world power of Russia: established in the mid -1950s as an effect of intensifying the air reconnaissance of US military aviation in the area, operating as a stopover and refueling point for Soviet military aircraft until 1991, it was abandoned during the collapse of the USSR, and reopened in 2012 under Russia's geostrategic ambitions to reaffirm Russia's great world power.

Another defining element of the military evolution of the Russian Arctic is the performance of nuclear tests. Between 1955 and 1990, in the Novaya Zemlya archipelago area, a number of 130 nuclear, 88 atmospheric, 39 underground, and three underwater tests [1] took place, of which we mention the most massive nuclear explosion in history, namely the "Tsar's Bomb" tested on October 30, 1961, and had an estimated power of 50-58 megatons, about 4,200 times stronger than the Hiroshima nuclear explosion (12 kilotons). One of the last nuclear weapons tests in the Russian Arctic took place on August 8, 2019, probably with a Burevestnik SSC-X-9 Skyfall rocket, which exploded during the tests, killing eight people, five scientists in the field of armaments [2]. This type of missile, which is still in the development phase, uses a nuclear propulsion system that could theoretically give it an unlimited range. On August 9, 2019, the Russian nuclear power agency Rosatom confirmed the radioactive emission at the Nyonoksa missile test site near Severodvinsk, the Arkhangelsk region of northern Russia. It said it was linked to an accident involving the testing of a "Radioisotopic sources for a liquid-fueled rocket". This incident led to significant increases in radiation levels in the area of Severodvinsk city. According to official data published by the Russian agency TASS, the radiation level in the area of Severodvinsk exceeded about three times the maximum allowed level of 0.6 microsieverts per hour, recording for a 30-minute value of 2 microsieverts per hour.

In recent years, we have seen an increase in the military activity of the Russian Federation, which involves the conduct of large-scale military exercises, including the exercise "Vostok 18" in which the Russian Federation participated with a number of 300,000 soldiers, of which an estimated that 75,000-100,000 fighters, 1,000 aircraft (aircraft and helicopters), 80 battleships and 36,000 armored and unarmored technical means [3].

Such significant participation had not taken place since the Soviet era, since 1981, when the ZAPAD-1981 exercise took place. In the Arctic area, this exercise was attended by elements of the Marines and Motorized Infantry, as well as the Northern Fleet, which carried out actions of amphibious landing on the shores of the Chukchi Sea. The Russian administration's level of interest in the Arctic has materialized through the construction of a modern military base at Nagurskoye on Alexandra Island in the Franz Joseph Archipelago, about 600 km east of the Svalbard Archipelago and 1,350 kilometers north of Murmansk. Russia is also building four other Arctic military bases at Rogachevo, Cape Schmidt, Wrangel, and Sredniy [4]. If we follow the geographical arrangement of these bases, we can understand that they are arranged from west to east, from Murmansk to the Bering Strait, along the northern sea route.

These actions also have a discouraging role and are directed against NATO or non-NATO entities that could, from Russia's perspective, threaten national security and their nature reserves.

Another aspect of the current confrontational environment is the hybrid threat or hybrid warfare. The concept of hybrid action may be the result of "*a kaleidoscope of conventional and unconventional components, in the context of the emergence and expansion of new forms of aggression, influence, and coercion.*" [5].

A defining peculiarity of the hybrid conflict is the continuous fluctuation between conventional and unconventional actions. For example, on August 24, 2014, when unconventional pro-Russian paramilitary forces appeared to suffer defeat by the Ukrainian armed forces in Donetsk and Luhansk, it generated a conventional reaction from Russia, sending established battalion-level combat elements to Russia, to prevent the offensive.

From the point of view of the specific issue regarding CBRN support, the hybrid confrontation environment requires a sophisticated, multidimensional approach. The issue of threats to the use of means of weapons of mass destruction by an enemy that is very difficult to identify is complemented by operations of sabotage and industrial destruction that can have critical effects on military forces, the population, and the environment. As an example, we mention that one of the worst environmental incident reported in the contact area between Ukrainian and separatist forces was caused

by the flooding of coal mines in the Donbas area, which led to contamination of water sources, increases in radioactivity in the area and thus generating a massive ecological disaster [6].

Typology of CBRN actors and threats in the current operational environment

Nuclear hazard.

In terms of destruction capabilities, nuclear weapons are by far the biggest menace. After the United States, several states developed their programs and subsequently conducted nuclear tests. The Soviet Union conducted the first nuclear test in 1949, followed by Britain in 1952, France in 1960, and China in 1964. Aware of the danger posed by the uncontrolled number of nuclear warheads, the United States initiated the Nuclear Non-Proliferation Treaty in 1968 (NPT), and, in 1996, together with other states, the Comprehensive Nuclear Test Ban Treaty. The Nuclear Non-Proliferation Treaty has been signed by 191 states, including the United States, Russia, the United Kingdom, France, and China. India, Israel, Pakistan, and South Sudan have refused to join the NPT, and North Korea announced its withdrawal in 2003. According to the latest assessments in 2019, the global nuclear arsenal totals an estimated 14,000 nuclear warheads, of which 9,500 are operational. [7].

figure no. 1.

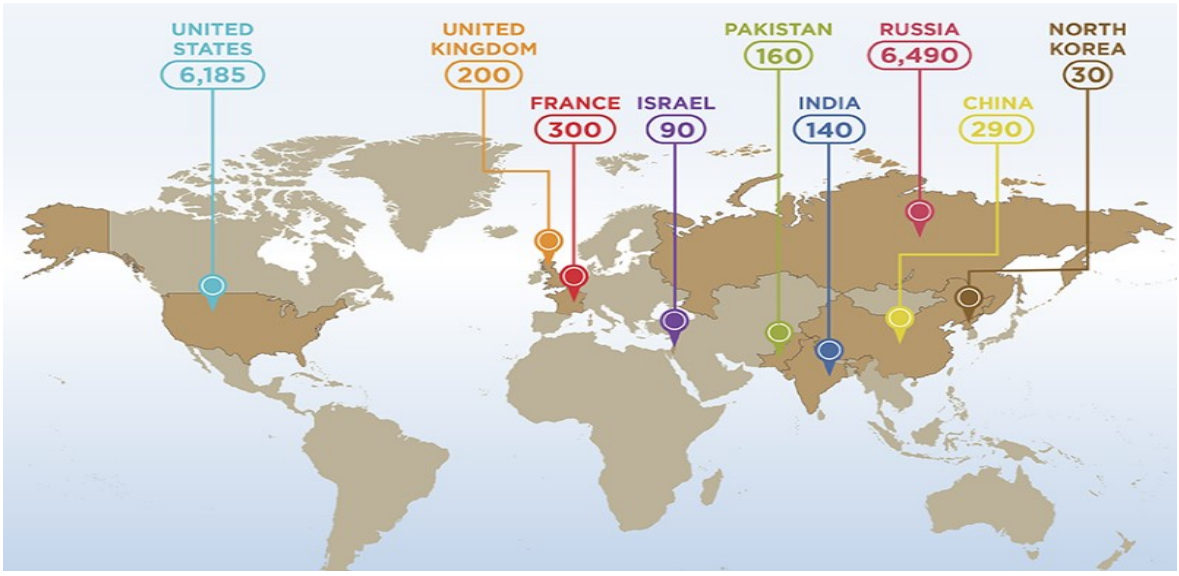

Figure no. 1. - The global inventory of nuclear warheads in 2019

Chemical and biological hazards

Since antiquity and later in the Middle Ages, chemical and biological means (poisoned arrows, toxic fumes, biologically contaminated corpses) had a negative effect. They were considered inhuman and treacherous, even by the standards of those times. The first attempt to regulate the prohibition of these means took place in 1675 when a treaty was signed in Strasbourg between France and Germany on the prohibition of the use of poisoned bullets. Subsequent treaties signed in 1874 in Brussels, in 1899 and 1907 in Hague on the prohibition of the use of toxic gases on the battlefield, did not prevent the use of more than 124,000 tons of chlorine, mustard and other toxic substances in the First World War, causing the death of over 90,000 people and the injury of over 1,000,000. In 1925, in Geneva, a protocol was signed, banning the use of toxic gases and biological means to avoid repeating the horrors of the First World War.

The suspicion that one of the strategic opponents of the Cold War could use weapons of mass destruction caused the chemical and biological arsenal of the US and the Soviet Union to increase rapidly, the quantities being in the order of tens of thousands of tons [8]. After a long period of negotiations, the very existence of these enormous quantities compelled the establishment of the Organization for the Prohibition of Chemical Weapons (OPCW) in 1997, intending to ensure the destruction of the entire world chemical arsenal. At the time of the establishment of the OPCW, the following countries owned or developed chemical or biological programs: Albania, China, Cuba, Egypt, India, Iran, Iraq, Israel, Libya, North Korea, South Korea, Russia, Sudan, Syria, Taiwan, and the USA.

Due to the measures taken and the open policy on the elimination of the chemical and biological arsenal, gradually, Albania, India, Iraq, Libya, South Korea - and after Taiwan's statement - completely neutralized the stocks held. Cuba, Egypt, and Iran, although they have the necessary facilities for research in the field of microbiology and have the capability to produce toxic fighting substances, are in line with the provisions of the OPCW.

The ***United States*** and ***Russia*** are a select, separate category between these actors, primarily due to their interests and the vast amounts of chemical and biological agents they have ever had. For example, until the start of chemical neutralization, Russia reported to the OPCW the existence of about 40,000 tons of chemicals, including Vx, sarin, soman, mustard, lewisite, mustard-lewisite mixture and phosgene! In the same context, the USA reported the existence of 27,770 tons of war chemicals [9]!

Although it is estimated that almost 90% of the reported chemical arsenal has been destroyed, both Russia and the US accuse each other of not giving up the entire chemical arsenal altogether, which is most likely right!

Israel, also in this situation - as in the case of nuclear weapons - did not provide sufficient information respecting the chemical arsenal, but this position should be considered as a reaction to the unusual situation of the Jewish state which has a complicated geostrategic position, being surrounded by extremely hostile state and non-state entities.

The countries with the most volatile policy regarding the possession and use of chemical and biological weapons are North Korea, Syria, and Sudan.

North Korea. The Pyongyang regime will likely consider the use of the biological weapon as a military option. In 2012, the South Korean Ministry of Defense estimated that North Korea is capable of producing biological agents such as anthrax, smallpox, plague, tularemia, and hemorrhagic fever. Clear evidence that the North Korean regime would not hesitate to use biological and chemical weapons of mass destruction occurred in February 2017. Then North Korean agents used the neuroparalytic agent Vx to assassinate Kim Jong Nam, the dictator's stepchildren of the president Kim Jong Un at Kuala Lumpur Airport, in Malaysia [10].

Regarding warfare chemicals, it is estimated that North Korea has considerable quantities, belonging to all classes of toxic substances, for military use.

Syria. It is estimated that Syria has biological agents, but there is not much information on the agents' type and quantity. The only certain information is that in July 2014, Syria stated that it has production facilities and stocks of purified ricin oil. Although Syria told the OPCW that it destroyed 1,308 tonnes of mustard gas in January 2016, likely, there will still be significant amounts of toxic fighting substances in Syria, including VX, sarin, blistering agents, but especially chlorine, which can be used as a combat gas, without being part of the list of toxic substances needed to be declared to the OPCW. Even worse is the fact that Syria can launch these agents with SCUD type missiles. Between 2012 and 2018, there were about 300 chemical attacks in Syria [11], mostly attributed to government forces.

The worst chemical munitions attack in Syria occurred on August 21, 2013, in a suburb of Damascus, Gouta. This attack, carried out with artillery missiles, with sarin ammunition, resulted in at least 281 dead [12], half of them women and children. The French Ministry of Defense issued these data based on a detailed analysis, recorded images, and the study of the injured's pathology. Another particularly severe attack occurred on April 4, 2017, at Khan Shaykuh, probably also with sarin, and resulted in 74 dead and over 500 injured. This particularly severe event prompted the reaction of US President Donald Trump to order a Tomahawk missile attack on Shayrat Air Base, where the attack is believed to have taken place. figure no. 2.

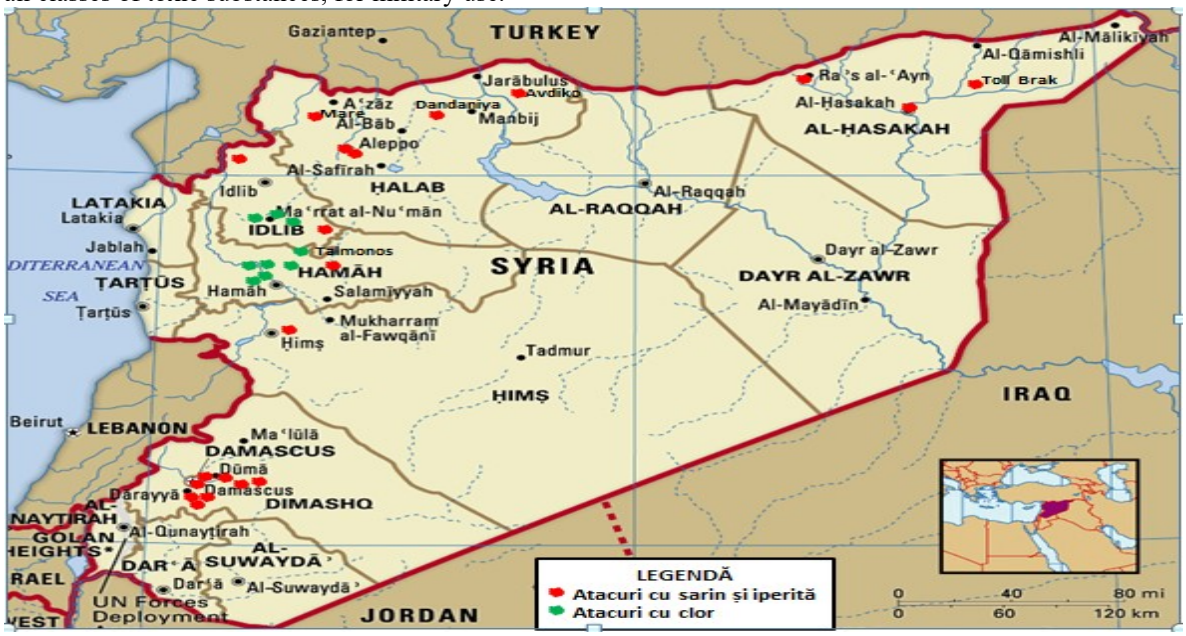

Figure no. 2. - Graphic representation of the worst chemical attacks in Syria

It should be noted that the Syrian government has vehemently denied any involvement in these attacks, and has argued that it is most often a matter of hitting insurgent chemical weapons depots. Another important aspect is that Russia, as a supporter of the Bashar al-Assad regime, has used its veto power at UN assemblies to prevent international reprisals against the Damascus regime.

Sudan. Sudan has been facing a civil war since December 2013 that has killed more than 400,000 people. In one of the major conflicts of this war, namely the offensive of government forces against the rebels in Jebel Marra in January 2016, it is estimated that chemical weapons were used, namely toxic bladder fighters [13]. As the access of representatives of world human rights organizations, doctors, or

chemical weapons specialists had been denied, the estimate of these toxic means usages was made exclusively based on the testimonies of victims as well as those who provided medical care and the few images recorded with victims of these attacks.

From this synthesis, it follows that the danger of using chemical and biological weapons is as current as possible, despite international organizations' efforts to eliminate these means from the arsenal of states. Moreover, any state with advanced chemical industry and research program can produce toxic substances that can be used in a potential conflict. Finally, the danger of the use of chemical, biological, and radiological agents by non-state entities or organizations for terrorist purposes must also be considered.

The hazard of releases other than attack (ROTA)

Many industrial facilities worldwide produce, process, or store chemicals that, although industrial use, can also be used as toxic fighting substances.

Contamination resulting from the discharge of toxic industrial substances or large-scale fires can cause contamination of air, land, and water, thus having significant implications for the environment. Consequently, it is mandatory for commanders at all tactical levels to know the sources of risk in the area of responsibility to be able to apply for the necessary CBRN protection following accidental or intentional contamination. To emphasize how dangerous these events can be, we note that the worst chemical industrial accident in history occurred on December 2, 1984, in Bhopal, India when about 40 tons of methyl isocyanate, a gaseous derivative of cyanide used in the production of pesticides they leaked from a tank, causing more than 3,800 deaths in a short time and causing the premature death of about 15,000 people.

The sources of industrial chemical risk in the area of operations must be very well known. The protection and detection capabilities of these industrial chemicals in the military is greatly diminished, the protection and detection equipment being more oriented towards protection against known toxic substances. Another element that significantly complicates the management of crises caused by an industrial chemical event is the dominant effect on the civilian population and the environment.

Last but not least, military commanders must also consider the danger of possible epidemics, which, as has been seen in the case of the Sars-Cov-19 pandemic, can cause huge imbalances, with devastating effects on personnel and the medical system.

Final remarks

To conclude, excluding the CBRN threats from the approach to an armed conflict, all the more so in the actions of a multinational coalition force, would be a critical mistake! The illustrious military theorist Carl von Clausewitz emphasized that “The events of each age must be judged according to its particularities and that the purpose of the theory is the teaching of war not in ideal but real conditions.” [14]

We considered it appropriate to address the particularities of CBRN support and the impact of this environment on military personnel and equipment in the context of current factors, on the effects of global warming on the Arctic, whose accessibility and importance will increase in the future.

Therefore, commanders' role is to create a mechanism for collecting, analyzing, and disseminating data on the unconventional arsenal of a potential aggressor, to identify all threats, including those of a CBRN nature, and to constitute a pre-conflict threat package procedures in the field of CBRN, specialized forces, equipment, and protective equipment to diminish the damaging effects of these hazardous agents.

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СОВРЕМЕННАЯ ОПЕРАЦИОННАЯ СРЕДА В КОНТЕКСТЕ УГРОЗЫ ПРИМЕНЕНИЯ ХИМИЧЕСКОГО, БИОЛОГИЧЕСКОГО, РАДИОЛОГИЧЕСКОГО И ЯДЕРНОГО ОРУЖИЯ МАССОВОГО УНИЧТОЖЕНИЯ

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В нынешних условиях преобладает наиболее серьезная угроза глобальной безопасности, как и 50 лет назад, - возможность использования ядерного арсенала. Этот арсенал продолжает обновляться, включая все более передовые технологии и современные векторы, способные транспортировать эти средства на очень высоких скоростях и практически неограниченные расстояния.

Важной особенностью современных военных конфликтов является многогранный характер, свойственный гибридной войне. Нетрадиционные гибридные угрозы также могут включать возможное использование химического, биологического, радиологического и ядерного оружия массового уничтожения с целью создания повреждений или диверсий, которые могут привести к загрязнению токсичными промышленными веществами.

Нынешняя операционная среда выглядит кристаллизованной в новой, более утонченной и изощренной форме холодной войны, с двумя основными классическими стратегическими блоками, а именно НАТО и странами-партнерами, с одной стороны, и Российской Федерацией в качестве противоположного полюса. Два основных субъекта - не единственные составные элементы нынешнего геостратегического ансамбля. К этому следует добавить конфликт в Сирии, напряженность в Израиле и Палестине, сложные американо-иранские отношения по поводу ядерной программы последнего государства, нестабильность режима Ким Чен Ына в Северной Корее и, что не менее важно, рост Китая и Индии как с экономической точки зрения, так и как военных супердержав. В этом исследовании мы подробно рассмотрим основы международного права в отношении владения, производства и использования химического, биологического, радиологического и ядерного оружия массового уничтожения, заявленные арсеналы оружия массового уничтожения основных мировых игроков и то, как оно использовалось в недавних конфликтах.

***Ключевые слова**: гибридные угрозы, химическое, биологическое, радиологическое и ядерное оружие массового уничтожения, токсичные промышленные вещества.*

СУЧАСНЕ ОПЕРАЦІЙНЕ СЕРЕДОВИЩЕ В КОНТЕКСТІ ЗАГРОЗИ ЗАСТОСУВАННЯ ХІМІЧНОЇ, БІОЛОГІЧНОЇ, РАДІОЛОГІЧНОЇ І ЯДЕРНОЇ ЗБРОЇ МАСОВОГО ЗНИЩЕННЯ

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В умовах сьогодення переважає найбільш серйозна загроза глобальної безпеки, як і 50 років тому - можливість використання ядерного арсеналу. Цей арсенал продовжує оновлюватися, включаючи всі найбільш передові технології і сучасні вектори, здатні транспортувати ці засоби на дуже високих швидкостях і практично необмежені відстані.

Важливою особливістю сучасних військових конфліктів є багатогранний характер, властивий гібридної війни. Нетрадиційні гібридні загрози також можуть включати можливе використання хімічної, біологічної, радіологічної та ядерної зброї масового знищення з метою створення ушкоджень або диверсій, які можуть привести до забруднення токсичними промисловими речовинами.

Сучасне операційне середовище виглядає кристалізованим в новій, більш витонченій формі холодної війни, з двома основними класичними стратегічними блоками, а саме НАТО і країнами-партнерами, з одного боку, і Російською Федерацією в якості протилежного полюса. Два основні суб'єкти - не єдині складові елементи нинішнього геостратегічного ансамблю. До цього слід додати і конфлікт в Сирії, напруженість в Ізраїлі і Палестині, складні американо-іранські відносини з приводу ядерної програми останньої держави, нестабільність режиму Кім Чен Ина в Північній Кореї і, що не менш важливо, зростання Китаю та Індії як з економічної точки зору, так і як воєнних супердержав. У цьому дослідженні ми докладно розглянемо основи міжнародного права щодо володіння, виробництва і використання хімічної, біологічної, радіологічної та ядерної зброї масового знищення, заявлені арсенали зброї масового знищення основних світових гравців і то, як вона використовувалося в недавніх конфліктах.

***Ключові слова:** гібридні загрози, хімічна, біологічна, радіологічна і ядерна зброя масового знищення, токсичні промислові речовини.*