

THE IMPACT OF TECHNOGENIC ACCIDENTS ON THE SECURITY ENVIRONMENT

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Abstract: *The situation changes in territory of our country lead to change in nature and importance of security factors and threats. Threats of technogenic nature for national security were analyzed. The factors for risk assessment of the impact of anthropogenic accidents on the security environment are presented.*

Keywords: TECHNOGENIC, ACCIDENTS

1. Introduction

In the beginning of 21st century the system of international relations was bound up with periodic and often contradictory tendencies. There are technological, environmental and demographic changes that have a huge impact on the public processes in the every countries.

The dynamics of international relations shows that in recently years of armed clashes between armed groups of ethnic, religious, financial, territorial-community and other controversies has decreased. Changes that occurred in last decade of the twentieth century and in the beginning of 21st century form a new strategic environment of security and proportion of military political forces on a global and regional scale. Along with the positive trends, there are a number of risks and threats, mostly of asymmetric nature.

In the context of new geopolitical realities, the Republic of Bulgaria and the other countries from Alliance and European union, must be deal with risks of a difficult nature, such as acts of terrorism, proliferation of nuclear and conventional weapons, technological and cyber-attacks targeting modern communication and information systems, government infrastructure, with many environmental threats and the lives and health of citizens. The new threats are mostly asymmetrical and non-traditional in nature. These new realities make it a matter of studying the various threats - traditional and non-traditional, particularly topical.

The topic is up to date and has a bearing on whole of the society, the state, and survival of mankind. There is no country capable of counteracting itself on new, invisible, unpredictable, and diverse threats to security. The aim of the report is to trace and analyze the leading traditional and new challenges, risks and threats to security in the first decades of the 21st century. The subject of development is the security environment at the beginning of the 21st century, and the subject of security threats and their impact on national security.

2. Relationship between National Security and Anthropogenic Accidents

The term "national security" first appears in American politics. For the first time, US President Roosevelt used the definition of "national security" in his speech to Congress in 1904. The accession justify of the Panama Canal Area to interests of national security. This term is used again by US President Franklin Roosevelt after the attack of Japan against the American military base at Pearl Harbor in December 1941.

According to Walter Lipman, "The state is in a state of certainty when it does not have to sacrifice its legitimate interests in order to avoid war, and when it is able to defend its interests if necessary by conducting war". [7]

In 1998, The National Assembly of the Republic of Bulgaria adopts the Concept of National Security, according to which "National security has the protection of the fundamental rights and

freedoms of Bulgarian citizens, state borders, territorial integrity and state independence, where there is no danger of an armed attack, violent change of the constitutional order, political dictates or economic coercion for the state, and the democratic functioning of state and civic institutions is ensured, as a result of which society and the nation keeps and increases their welfare and evolves. Security is guaranteed when the country successfully realizes its national interests, goals and priorities and, if necessary, is able to effectively protect them from external and internal threats.". [8]

In a nation-wide sense, the threat is defined as a presumption of an incident, a crisis situation, or of damage to basic values, interests and objectives of society, life, health and property of citizens, destruction of existing material and natural resources and the functioning of the economy as a result of the manifestation of these events. [9] The threats are detrimental to all systems of public life, from individual to state. The threat to individual is an intention or desire to damage dignity and integrity of another person.

"The risk" is defined as an act of uncertainty, probability of consequences, dangerous condition, damage and loss, benefit and profit, behavior. The risk is an indefinite threat. There is no definite time for it to happen. Even if it is established early enough, in principle it is impossible to neutralize. The risk resembles threat but differs from fact that there is no other condition between threat and crisis, whereas between emergence of the risk and the crisis that time has not been established. The threat is a specific risk with the possibility of immediate realization.

According to the National Strategy of the Republic of Bulgaria "The strategic environment of security is complex, dynamic and difficult predictable dimensions. Impact on its formation has been: globalization, crisis in financial and economic sphere, proliferation of weapons of mass destruction and means of delivery, climate and health problems, demographic, environmental and energy problems, asymmetric risks and threats, threats to information security, countries with weak statehood, internal and regional conflicts, European and Euro-Atlantic integration, efforts of the international democratic community to maintain stability and stability ". [8]

Protecting the population from disasters, accidents and catastrophes is a priority activity in civilized countries. In Europe and in our country there are natural and industrial risk factors that affect the security of people, production and property. They lead to the need for reliable protection of the population, the implementation of preventive activities to prevent or reduce the losses and the consequences of disasters, accidents and catastrophes.

As a consequence of the technological activity of a human, major industrial accidents can arise with separation of strong toxic substances from the pharmaceutical, metallurgical, chemical, textile industry, accidents in the nuclear power industry, etc. The main flow of vehicles transporting dangerous goods passes through the territory of the country, which, in the event of a catastrophe, creates conditions for pollution of the environment. The state of the road and rail infrastructure, as well as the organization of the controls, do

not meet the safety requirements and are prerequisites for catastrophes and severe consequences. In the case of transport accidents or oil spills, oil products or natural gas, conditions are created for pollution and danger to humans health.

There are sites in the country that deal with radioactive sources. They can lead to the creation of radiation accidents and incidents. Insufficient control by the competent authorities of different owners of radioactive isotopes and sources of ionizing radiation and incompetence of citizens creates conditions for uncontrolled radioactive exposure.

In part of the settlements sanitary and hygienic conditions are deteriorated, which is a prerequisite for epidemics and diseases of a significant part of the population. The existing production and economic conditions in our country, worsened international situation, insufficient control of the trade in animals and products from them create conditions for occurrence of biological outbreaks.

The lack of systematic technological treatment and fertilization of soils, the free use of plant protection products and climatic conditions lead to a reduction in part of permanent crops. The state of environment in a number of areas is approaching an environmental catastrophe that poses a direct life and health threat of the population.

In recent years the number of terrorist acts, the spread of narcotic drugs and human trafficking have increased, leading to a deterioration of the socio-economic conditions of life in the Republic of Bulgaria. [1]

3. Industrial Accidents affecting the Security Environment

There are many sites in the country's energy, chemical, metallurgical, petroleum and pharmaceutical industries. They work with explosive, highly flammable, combustible and highly toxic substances. They can cause industrial accidents and fires. Under adverse weather conditions, the pollutants released may cause environmental pollution of a cross-border nature.

Any mistakes in the operation of the Kozloduy NPP may lead to accidents involving the disposal of radioactive products in the environment. This may complicate the radiation situation, whereby a portion of the population can be irradiated above the admissible norms. In unfavorable weather conditions, if radioactive discharge is not controlled, radioactive contamination of the environment, including transboundary pollution, is possible.

In the operation of nuclear power plants there is a likelihood of an accident with possible radiation consequences for the population. The potential danger of such an accident shall be analyzed and evaluated beforehand in the design of the NPP, considering all possible emergency situations (realistic and hypothetical scenarios) and on that basis the necessary measures to prevent accidents and mitigate the consequences to an acceptable level according to regulatory requirements.[12]

According to the "Safe Use of Nuclear Energy Act", persons who carry out nuclear energy and ionizing radiation and radioactive waste and spent fuel management activities are obliged to take measures to prevent accidents and to limit and eliminate the consequences from them. The competent state authorities shall define and implement emergency planning and emergency preparedness measures in the case of a possible accident with possible radiological consequences. These measures are based on an analysis of the possible scenarios for the occurrence and development of various accidents and the assessment of the radiation risk to the population.

Despite stringent safety measures for the operation of different types of nuclear reactors and the availability of automated management, control and protection systems, operational practice indicates that emergency situations may arise which are accompanied by uncontrolled releases of radioactive substances into

the environment. Analysis of emergency situations shows that most often they are due to errors by the service staff, ie mostly subjective factors. [2, 3, 4]

Radioactive contamination could occur when:

- Emergency situation at Kozloduy NPP, accompanied by uncontrolled releases of gaseous radionuclides into the environment;
- transboundary radioactive contamination;
- in the case of a car accident carrying a radioactive material.

There are companies working with sources of ionizing radiation in the country. In the event of accidents, local outbreaks may occur, dangerous to the operating staff. They can become subject to intrusion, criminal trafficking and radiation terrorism.

On the territory of the country there are unplanned aviation, artillery, naval and ammunition in the quantity and location. Some have retained their combat capabilities and pose a risk of improper handling. Industrial failures are possible when they fall into the technological process of metallurgical firms.

There may be biological outbreaks as a result of insufficient control of trade and export of animals and products.

Large quantities of chemical substances are used and stored in the industry, which under certain circumstances - accidents or natural disasters - can become a threat to people's health and lives. To prevent accidents, strict preventive measures are taken, but if they arise, there must be an immediate response to the specialized bodies to address the situation and to eliminate the consequences.

All sites are practically chemically hazardous, using chemical technology. These are primarily chemical, petrochemical and similar plants and plants, repositories of hazardous chemicals and oil products warehouses. Chemical objects can also include a significant part of the non-chemical industries, in the process of which hazardous substances are applied and have chemical transformations. It is true that objects with chemical technologies are potential sources of hazardous substances and environmental pollution and they can be called chemical-risk sites. By Valery Legasov's definition, in the event of an accident at any industrial site, the process of destructive release of its own energy source, where raw materials, intermediate products, and plant production are involved in an emergency process, create disruptive factors for the population and the environment, the level of chemical risk is significantly high. [10]

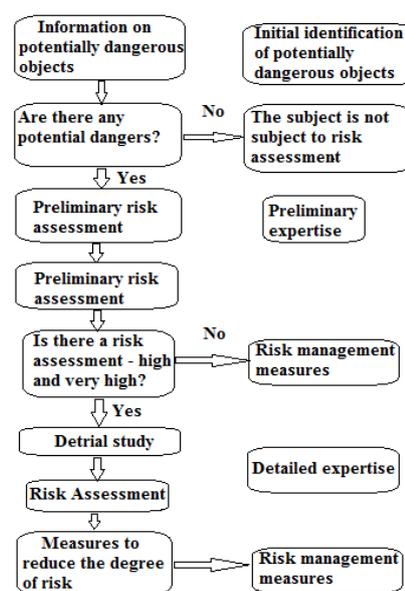


Fig. 1 Risk Analysis for Anthropogenic Accidents

Risk analysis for industrial accidents can generally be performed based on the scheme of Fig. 1.

4. Transport accidents affecting the security environment

Despite the rapid technological changes, the Balkans retain their important geostrategic position. With the enlargement of the EU and NATO, the importance of the region as a transport, infrastructure and energy junction is growing. The importance of the region is also growing, as a link with the European markets to the Caucasus and Central Asia.

Types of transport accidents can generally be divided by the center of the event, namely land, sea and air. The favorable geostrategic position of the Republic of Bulgaria is an important prerequisite for busy road, rail, air and water transport. The international routes to Central Europe, the Middle East, the Baltic States and Russia pass through the country. This creates conditions for transport accidents related to the transport of dangerous goods, causing environmental pollution and endangering human life and health.

On the territory of the country there is a process of development and distribution of the oil and gas transmission networks, telecommunications, the international traffic of commercial and industrial goods is enhanced. They represent an object of control.

The Danube and the Black Sea connect us with the countries of Central Europe and the Black Sea Basin. They are natural waterways for the transport of large quantities of petroleum products and severe accidents can have serious environmental consequences.

Under the conditions of a complex criminogenic situation, it is possible to cause accidents due to diversions of oil pipelines, gas pipelines, electricity transmission networks, theft and traffic of radioactive sources. Possible damage to infrastructure and production facilities. These potential dangers can lead to escalation of tensions that will turn into crisis. Transport plays a key role in the development of any modern society as a means of economic development and a prerequisite for achieving social and regional cohesion. Bulgaria's transport sector is of utmost importance for enhancing the competitiveness of the national economy and servicing the population. This is evidenced by the fact that as of 2008 the Bulgarian transport system provided on average daily 2.54 million passenger trips and 274 thousand tons of freight.

In our country, it was agreed on November 17 to honor the memory of those killed in crashes. The highest share of transport accidents in Bulgaria is related to road transport. Of course, there is no need to underestimate the railroad on which a significant amount of dangerous goods is carried, and the air in which the number of victims is numerous.

The assessment of traffic safety situation on the roads, in the light of tasks and objectives set out in the National Road Safety Improvement Strategy of the Republic of Bulgaria for the period 2011-2020, makes it possible to set certain priorities for work with a view to creating the conditions for continuing the trend of permanent reduction of victims of traffic accidents.

Table 1: Traffic accident statistics on the territory of Bulgaria. [11]

period	In 2017	In 2016	In 2015
traffic accident, num.	6 888	7404	7226
died, num.	682	708	708
injured, num.	8 680	9374	8973

5. Global Anthropogenic Risks affecting the Security Environment

Energy and resource security are an element of the national security. Water resource problems, environmental pollution, limiting access to strategic raw materials can lead to tensions and crises at national and in the international level. The modern economic and the technological development and use of resources, environmental pollution and urbanization bring environmental issues as a specific risk and a threat to national security.

In the modern world, political threats - terrorism, extremism, separatism, and so on - are becoming increasingly important.

A serious strategic threat to Europe is terrorism, especially since the Madrid attacks of 11 March 2004. In the past, the actions of terrorists are primarily directed at specific political leaders, and contemporary attacks are global in nature, cause many sacrifices and are mostly related to religious extremism. European countries are both targets of terrorism and its base. Al Qaeda bases are found in the UK, Italy, Germany, Spain and Belgium. That is why European counter-terrorism policy is paramount.

In the new international environment, terrorism gains greater comprehensiveness. Terrorists are rapidly developing ways and means of achieving their criminal objectives, involving more people, overcoming geographical barriers, and creating clusters between groups in one or more countries.

The proliferation of weapons of mass destruction is the greatest potential threat to European and world security. New technologies and research increase the potential danger of attacks with biological, chemical weapons and radioactive materials. The risk to Europe's security is rising with the proliferation of missile technology. Regional conflicts have an impact on European interests and regional stability. Whether in the immediate vicinity of EU borders (Balkans) or in different parts of the world, they cause numerous casualties, destroy social and material infrastructure, threaten minorities and fundamental human rights and freedoms. Conflicts are growing into extremism, terrorism and state instability. They lead to an increase in crime, stopping investment and disrupting the normal functioning of political and economic processes. [1, 8]

Existence of the conflict zones unresolved issues in inter-state relations, socio-economic problems, political instability and internal conflicts and inefficient cross-border control complicate the regional environment. A challenge for the national security is infiltration of refugee flows and illegal immigrants into the country. The social threats, including corruption, crime, drugs, illness, hunger, poverty and others, seriously threaten security in our country. Incorrect governance, corruption, abuse of power and weak institutions, lack of accountability and civil protests lead to a weakening of government and state institutions. The organized crime is an internal threat to the EU, but it has an external dimension. Trafficking in drugs, women, illegal immigrants is the criminal activity of organized criminal networks, often linked to terrorist groups.

The environmental threats including disasters, accidents, catastrophes, pollution and others have little impact on security. The origin of threats to security and the existence of man are increasingly associated with the unfavorable state of the environment. There is no doubt that environmental pollution can cause a number of ecologically-based diseases, resulting in a reduction in the life expectancy of people affected by adverse factors.

Environmental security threats include likelihood of occurrences of phenomena and processes whose implementation may lead to negative impacts on the environment and health of the population. These phenomena and processes are expressed in intentional or unintended environmental impacts of human activity or as a result of the occurrence of natural and natural disasters and catastrophes. [6]

The global risks resulting from human activity on the security environment - environmental catastrophes and socio-economic manifestations are detailed in [1].

6. Conclusion

Prognosis and analysis of potential dangers and threats indicates that they can lead to serious difficulties in the normal rhythm of the crisis areas. The vital management systems, normal functioning of the national economy and threatening the lives and health of the population can be impaired. The environment of security is characterized by high dynamism and increasing unpredictability. Changes in it depend primarily on the impact of non-military (asymmetric) risks and threats. Dynamic changes in the security environment have shown that conflicts and crisis situations that are complex and difficult to predict and manage can occur in the present and in the future with a high probability. This poses risks and threats to the national security.

In order to reduce the losses and to eliminate the consequences, it is necessary to plan and coordinate measures for the protection of the population and the national economy in advance with the state authorities, the local authorities and the national economy. Contemporary actions in carrying out emergency and emergency rescue work require the establishment of an organization, the preparation of authorities for leadership, forces and resources and their keeping in constant readiness. To ensure the implementation of the emergency and emergency rescue works and the provision of living conditions in distressed areas it is necessary to plan and allocate stocks of material and technical means and regulate the order and the ways of their use.

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