



CRITICAL INFRASTRUCTURE

CONCEPT AND SECURITY CHALLENGES

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Preface

Around the end of this year, which marks the 70th anniversary of NATO's foundation, the Alliance member states are expected to complete their national ratifications of the NATO Accession Protocol with the Republic of North Macedonia, making it officially the latest and 30th member state of the Alliance.

Aside from producing a variety of security, as well as economic and social benefits for each member state, being part of NATO also implies a lot of hard work, commitments and obligations for each segment of Macedonian society – the citizens individually, the institutions, organizations, and everyone else. This particularly comes to the fore when it comes to the issue of improving the rule of law and the independence of the judiciary, as well as boosting the development of the education and healthcare system in the country

It is precisely for these reasons that the Friedrich-Ebert-Stiftung decided to provide its input to this process by lending its support to certain endeavours that could prove useful to both the country as a whole and the individual sets of policies it will be pursuing over the next stages of its integration into NATO. The topic of critical infrastructure protection was brought forward in this context by the group of academic authors who co-wrote this publication and, after an inclusive process involving public debates and experts presenting their views on this matter, the final version of the material on critical infrastructure protection eventually saw the light of day.

Using Croatia as an individual example, it was vital to do case studies on newer member states of the Alliance, thus drawing on the experiences and learning of their own process of integration into NATO and how they have been functioning as full-fledged member states of the Alliance. Sharing experiences and good practices in this manner will be vital at this point when the country is going through the final stage of acceding to NATO, as well as in the months and years to come after the official accession when policies will start taking shape and be put into operation.

Having been put together to provide a presentation and elaborate upon all aspects of critical infrastructure protection, as well as to encourage activities to create a national strategy and ultimately adopt a law on critical infrastructure protection in the Republic of North Macedonia, we sincerely hope that this publication will draw the interest of the expert community in the country with regard to this matter and will prove to be of particular use to the relevant institutions when dealing with it going forward.

Nita Starova
Friedrich-Ebert-Stiftung Skopje Office

Introduction

The idea of writing a book like the one in front of you, entitled **“Critical Infrastructure: Concept and Security Challenges”** is a bold scholarly and erudite step. We have directed our long-term scientific and research career to several premises. The first basic premise of this book begins with the concept of critical infrastructure as a general set of values and goods that are essential to the economy, the state and the society. Disruption or destruction of such values and goods could have long-term detrimental effects on the core values of the society. Consequently, when creating a modern concept of critical infrastructure protection one recognizes the need to build a coordinated approach.

The second premise that characterizes this book is aimed at showing that the security problems faced by the states today have reached a level of seriousness and urgency. In such situations, it is understandable that quick fixes and ad hoc solutions are not enough and therefore it is necessary to consider actions that will help, or require an effective way of changing the approach to critical infrastructure protection.

The third basic premise of this book is the domain of critical infrastructure protection at national level, that is, individually and for this purpose we have singled out the examples of the United States and Croatia and the policies and processes that the EU and NATO have initiated and are striving to coordinate. These experiences are deemed valuable for future directions in the creation of the critical infrastructure protection system in the Republic of North Macedonia.

In the interest of a comprehensive analysis, we have also included two eminent foreign critical infrastructure experts, namely, Richard Larkin and Matthew Vatter. Their participation in this project, through their analysis of critical infrastructure protection in the United States, adds particular importance to the book in seeking a meaningful solution in the creation of a critical infrastructure protection system in the Republic of North Macedonia.

The content of **“Critical Infrastructure: Concept and Security Challenges”** is systematized in six chapters.

Within the **first chapter** entitled **“Critical Infrastructure: Notion and Concept”**, the emphasis is put on the notional determination of infrastructure as critical. In this context are also elaborated the threats on critical infrastructure and the need for critical infrastructure protection. Furthermore, this part also includes a section referring to the analysis of the Critical Infrastructure Indicative List.

In the **second chapter** entitled **“Critical Infrastructure Protection in the European Union”**, the focus of the research is dedicated to the development of critical infrastructure protection from the perspective of the European Union, the work of the Union’s institutions and the orientation of this domain for cooperation with the private sector. This part also covers the section concerning Directive 2008/114/EC on the identification and determination of European critical infrastructures and the assessment of the need to improve their protection.

In the **third chapter** entitled “**Critical Infrastructure Protection in NATO**”, the focus of interest is the Alliance’s place and role in critical infrastructure protection and through critical analysis of a segment of NATO’s involvement and role in critical infrastructure protection an attempt is made to tackle several important issues. One of them is whether NATO is conducting excessive securitization and militarization of the energy sector, which is dominantly perceived as an exceptional economic issue and whether there is an appropriate role and opportunity for engaging NATO in critical infrastructure protection within the framework of strategic concepts, especially after the end of the Cold War.

Within the **fourth chapter** entitled “**Critical Infrastructure Protection in the United States**”, the emphasis is put on analyzing one of the leading countries in the development of critical infrastructure protection. In this context, the concept and system of critical infrastructure protection with the three basic segments the functional, political and technical mechanisms for critical infrastructure protection are very carefully elaborated.

In the **fifth chapter** entitled “**Critical Infrastructure Protection in Croatia**”, the achievements in the development of critical infrastructure in Croatia made so far have been analyzed. In this context, Croatia’s approach has been elaborated upon adoption of the Law on Critical Infrastructure Protection and bylaws, as well as the organization of the critical infrastructure protection system.

The **sixth chapter** entitled “**Republic of North Macedonia and Critical Infrastructure Protection**”, provides an overview of the current situation in the Republic of North Macedonia related to building an efficient system for critical infrastructure protection. This section identifies priority sectors of critical infrastructure such as energy, information technologies, water systems and air transport. In each of the sectors mentioned, as a result of the reform efforts of the state, there are certain laws and bylaws that can enable effective regulation of critical infrastructure protection. Based on such situations, appropriate measures and recommendations are being offered that would be most useful in the organization of critical infrastructure protection. As an example, the ways and opportunities for creating an effective strategy for protection of critical energy infrastructure are offered. The strategy, after identifying the existing risks, should provide the right direction to overcome the situation of lack of positive legislation on critical energy infrastructure. However, the authors emphasize that partial solutions have been identified in different sectors of critical infrastructure, which are not faulty but are likely to contribute to “stifling” the entire process of designing and efficient functioning of the optimal system for critical infrastructure protection. As a result of such situations, at the end of the chapter, broader recommendations have been given that should outline practical steps towards building an effective system for critical infrastructure protection.

We express our gratitude to the reviewers Professor Jonas Johansson, Director for Critical Infrastructure Protection Research, Lund University, Sweden and Professor Roberto Setola, Univertsita Capmus Bio-Medico di Roma, Italy, for presenting us with the honour of accepting to peer review this manuscript, and their knowledgeable, academic and sincere support for the publication of this book.

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The authors
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CHAPTER 6

REPUBLIC OF NORTH MACEDONIA AND CRITICAL INFRASTRUCTURE PROTECTION

Republic of North Macedonia and Critical Infrastructure Protection

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Modern security threats assume a new “innovative” dimension that requires expanding the scope and understanding of certain security threats that can negatively affect the functioning of critical infrastructure. In doing so, they become more sophisticated and more destructive in its manifesto. Such a situation eminently emphasizes the need to develop a modern concept of national resistance and a modern concept for critical infrastructure protection.

In this chapter, the authors refer to the current situation in the Republic of North Macedonia related to the building of an effective system for critical infrastructure protection. Priority sectors, such as energy, information technologies, water systems and air transport have been identified. As a result of the country’s reform efforts, in each of the sectors indicated, there are certain legal and secondary legislation that can enable efficient regulation of critical infrastructure protection. Consequently, the authors offer appropriate measures and recommendations that would be most appropriate in the organization of critical infrastructure protection. For instance, an example is provided for creating an effective strategy for critical infrastructure protection. After identifying the existing risks, the strategy should give the right direction to overcome the situation regarding the lack of positive legislation on critical energy infrastructure. However, partial solutions in different critical infrastructure sectors have been identified, though not wrong, are likely to contribute to the “suppression” of the whole process for creating and effectively functioning of the optimal system for critical infrastructure protection. At the end of the chapter, as a result of such conditions, recommendations are given for taking practical steps in the direction of building a critical infrastructure protection system.

6.1. Conditions in the Republic of North Macedonia in the Field of Critical Infrastructure Protection

As a result of the Euro-Atlantic commitments, the Republic of North Macedonia undertakes and realizes a great deal of reforms that inevitably affect the spectrum of issues related to critical infrastructure protection. After its independence, the Republic of North Macedonia began to pursue its own autonomous policy in all

domains of social life, as an equal international legal entity. In that direction, it builds its own principles of foreign policy, as well as security policy principles within that framework, as an inseparable part in realization of own national interests.

In the line of the most important activities, including critical infrastructure protection one can list the following:

- defining objects as critical infrastructure;
- defining measures for their protection and safety;
- defining tasks and responsibilities.

From this aspect, it is of particular importance to note that the determination of critical infrastructure in the Republic of North Macedonia is not in accordance with the guidelines of the European Union. In that sense, there is a lack of clear specification of the critical infrastructure term. Therefore, it is generally accepted that in the specification of objects as critical infrastructure, one should start from the analysis of several decisions, as follows:

- Decision on determining persons and objects for protection. This Decision was adopted based on the Internal Affairs Law. The Decision precisely lists the objects of interest for the security of the Republic of North Macedonia, such as: electric power, postal and shipping, railways, airports, water supply, etc.
- Decision on determining the legal entities that are obliged to have private security¹³ The Decision specifies the protection of legal entities, whose activity includes the following:
 - handling radioactive substances or other substances hazardous to people and the environment;
 - legal entities registered for production and wholesale of medicines and medical devices;
 - legal entities registered for production and trade of flammable liquids and gases;
 - legal entities registered for transport of dangerous goods;
 - legal entities registered for handling objects and facilities of particular cultural and historical significance.¹⁴

In order to be able to operatively, professionally and efficiently protect the critical infrastructure in the Republic of North Macedonia, part IV of this Decision defines the obligation for private security of the legal entities, especially when the interest is attaining security of the Republic of North Macedonia. In particular, several sectors have been defined, namely:

- energy (production, transmission and distribution of energy);
- water supply;
- environment;

13 This Decision was adopted by the Government of the Republic of Macedonia in 2013, and the need for its adoption derives from the Law on Private Security from 2012 and the Law on Amending and Supplementing the Law on Private Security, adopted in 2013.

14 Decision on determining the legal entities that are obliged to have private security, "Official Gazette of the Republic of Macedonia", no.106/2013, Article 2

- Macedonian Radio and Television, electronic and print media;
- National Bank of the Republic of North Macedonia and other legal entities registered for carrying out banking activities.¹⁵

6.2. Protection and Security of Critical Infrastructure in the Republic of North Macedonia

Protection and security of critical infrastructure in the Republic of North Macedonia should be directed towards several key sectors, such as:

- energy sector;
- information technologies;
- water systems; and
- air traffic.

Energy sector in the Republic of North Macedonia is regulated in accordance with the Law on Energy. Here, as a priority, we would highlight strategically the most important companies, such as: “ELEM” (Macedonian Electric Power Plants) and “JSC MEPSO” (Macedonian Electricity Transmission System Operator), which together with their capacities represent the pillar of the energy system. While in the oil industry, “JSC OKTA” has priority in the protection because it has a significant role in the sale, supply and distribution of oil derivatives in the Republic of North Macedonia.

Information Technologies. In this sector, a special emphasis should be placed on the wide range of measures for critical infrastructure security and protection. As priorities, we would single out strategically the most important critical infrastructure, that is: “Makedonski Telekom” and “VIP”. These are the companies that, with their entire capacities, represent the pillar of the landline and mobile network and the most sophisticated information technologies.

Water systems in the Republic of North Macedonia are regulated in accordance with the Law on Waters. In this sector, special emphasis should be placed on the wide range of measures for security and protection of surface waters, lakes, reservoirs and springs, water management facilities and so on. To this end, it is necessary to provide:

- availability of sufficient quantities of healthy and clean drinking water;
- supply of healthy drinking water;
- prohibition or restriction of use in case of its contamination;
- taking measures to continuously ensure the quality of drinking water.

Air traffic in the Republic of North Macedonia is regulated in accordance with the Aviation Law. According to this Law, organizations involved in the safety of civil aviation at national level are the following:

- Civil Aviation Agency;
- Ministry of the Interior;

¹⁵ Ibid

- Airport operators; and
- Air carriers. (Aviation Law, 2015).

Effective security of this critical infrastructure can be achieved only if several preconditions are met, namely:

- continuous development;
- implementation of legal regulations;
- continuous undertaking of measures, programs and procedures.

Hence, we can conclude that in order to achieve a standardized level of aviation safety, through the body responsible for security (usually the Civil Aviation Agency) it is necessary to adopt the following:

- a comprehensive policy, supported by legal regulations, to be implemented by all entities involved in any civil aviation security structure;
- each of the aforementioned subjects, police services, air carriers, intelligence services, etc, must have clearly defined policies, procedures, standards of action and methods of application in accordance with the guidelines of the state;
- proposal for establishing a National Security Committee and a Committee for Airport Safety;
- other efficient bodies to implement in a coordinated way the policy and standards for implementation of security measures. (Alcheski, 2016: 213-2014).

6.3. An Example of Creating an Effective Strategy for Critical Energy Infrastructure Protection

Assuming that in the domain of critical infrastructure protection, the energy and transport sector will be a priority for the Republic of North Macedonia in the process of EU integration, on this occasion we will make a cross-section and analysis of the situation in the area of energy sector.

The precise definition of energy infrastructure of the Republic of North Macedonia is part of the emphasized reform efforts. As one of the structural elements and an integral part of the critical infrastructure, the energy infrastructure is a subject to numerous measures and activities for its protection. What we must emphasize is the fact that the activities undertaken to secure the energy infrastructure constitute a separate concept, different from the concept of energy security that primarily focuses on politically and economically motivated disruptions in the supply of the corresponding energy resources. The modern concept of protecting the energy infrastructure of the developed countries is relatively new and different from the traditional – defensively focused – way of securing energy infrastructure. It is comprehensive and integrated into the concept of critical infrastructure protection and has an inseparable connection with national security. This means that besides state institutions, all relevant structures from the private sector that manage the energy infrastructure are included. As a result, the modern concept has a serious potential to develop into a **system** that drastically reduces the risk of modern security threats.

Generally, despite the fact that in our country there is no positive legislation on critical infrastructure, there is still some kind of protection of the facilities and systems that fall into the critical infrastructure category. Unfortunately, such partial solutions, which are often non-consolidated, are not translated into a system, so in practice some institutions may overlap in competencies or in parallel, and act differently. Hence, the importance of this area is perceived, which in itself is an important security issue, and needs to be regulated accordingly. By adopting appropriate legislation (law, by-laws) first, a clear system would be finally established to define the key terms in this area, identify the basic sectors or areas of critical infrastructure, clearly define and assign the role of the central body for coordination, etc., which will result in the creation of an optimal **system** in which all necessary, especially human resources will be located and appropriately utilized and because the critical infrastructure protection necessarily requires planning and implementation of security measures and a prompt and appropriate response to the dangers and possible damages. They should include not only state capacities, which are still limited, but also the enormous resources offered by the private security sector.

Nevertheless, as long as the state does not establish the concrete system for critical infrastructure protection, state authorities must accept the current state, that is, partial normative regulation of this issue. As an example, we emphasized the important sphere of energy and energy infrastructure protection will be analyzed.

If an analysis of several national strategies for critical infrastructure protection of the EU and NATO Member States is made, it will be determined that the interest in protecting energy infrastructure from asymmetric threats or natural disasters is one of the key imperatives of modern democratic states. Therefore, modern states and their energy sectors respond appropriate measures as well as responsibility to guarantee the availability of the necessary quantities of energy resources at any time and without interruption that would imply additional security or economic problems. In this context, the Republic of North Macedonia should not and must not be an exception. As a country with an extremely important geopolitical and geostrategic position in Europe and defined strategic determinations for integration into the EU and NATO, the energy infrastructure of the Republic of North Macedonia is not immune to global asymmetric threats. In the recent history, the Republic of North Macedonia has not yet faced specific security threats and damage to the energy infrastructure that would have serious consequences for its economic and security situation. However, the lack of operational national and legal regulations for prevention, as well as an appropriate response in case of threats to the security of energy infrastructure – as a result of asymmetric threats – has the potential to cause serious consequences for the Republic of North Macedonia and its citizens. Since it is a national security problem, it is obvious that the security of energy infrastructure is primarily the task of the Government of the Republic of North Macedonia but not its single responsibility. To a large extent, this is because many potential terrorist or subversive goals – such as hydro power plants, thermal power plants, Okta refinery, Thessaloniki-Skopje pipeline, the main gas pipeline Deve Bair-Skopje and so on, are owned or managed by private or mixed companies where the state also has a significant share. That is why the

Government and the energy sector, in addition to their equally important and interconnected obligations, have legal responsibility for protecting the energy infrastructure of the Republic of North Macedonia as well.

In order to determine the key factors for adopting an effective strategy for protection of the energy infrastructure of the Republic of North Macedonia, in this section we will analyze the relevant legal and by-law acts that partially regulate the protection and security of energy infrastructure.

6.4. Legal Norms and Shortcomings for Adoption of Energy Infrastructure Protection Strategy of the Republic of North Macedonia

Appropriate strategic and legal solutions are a prerequisite for building an efficient system for critical infrastructure protection. Based on the examples of the majority of the EU and NATO Member States, in the search for the legal basis for protection of the energy infrastructure of the Republic of North Macedonia, the following should be analyzed:

- Defense Strategy of the Republic of North Macedonia;
- Law on Crisis Management;
- Law on Protection and Rescue;
- Law on Energy.

This approach is one of the possible ones, based on the assumption that each sector of critical infrastructure will have an appropriate strategic and legal solution that will enable efficient protection of critical infrastructure. As a result of the analysis, we will highlight several key findings that have been of great importance in terms of determining the legal shortcomings that the Republic of North Macedonia in the future will have to direct its efforts in the creation of favourable conditions for adopting a strategy for energy infrastructure protection.

6.4.1. Defence Strategy of the Republic of North Macedonia

Safety and protection of citizens is the primary responsibility of the Government of the Republic of North Macedonia. According to the Defence Strategy of the Republic of North Macedonia, “the development and maintenance of the security and defense system is one of the basic tasks of the Government of the Republic of North Macedonia in the interest of its citizens” (Defence Strategy of the Republic of North Macedonia, 2010). This obligation towards the national security of the Republic of North Macedonia cannot be fulfilled by the Government without adequate protection of energy infrastructure. The power sector, the oil and petroleum sector, as well as the other segments of the energy infrastructure are an integral part of the security and well-being of North Macedonian citizens. Similarly, to the state, citizens of the Republic of North Macedonia need a functional and stable energy infrastructure – resistant to asymmetric threats, natural or technological disasters – which will timely and in the required quantities supply the energy resources necessary for maintaining and advancing the security and well-being of Macedonian citizens.

Therefore, in addition to the state authorities, companies, public enterprises, institutions, services and units of local self-government, can perform special tasks in the area of defense, especially in the function of energy infrastructure security. This is especially true for energy operators, which, driven by the goal of safe, timely, and quality supply of consumers – including citizens and state authorities – are obliged to undertake appropriate preventive and safety measures covered by other legal and by-law acts analyzed in this section. In order to be able to respond to the complex requirements arising from strategic commitments for full integration into the EU and NATO, the defense system of the Republic of North Macedonia is being built and developed based on several factors, which indirectly affect the national energy infrastructure. Assessment of contemporary security threats, risks and challenges at national, regional and global level, geopolitical determinants, as well as national resources and projected economic opportunities of the state are the key factors that should be taken into account in the planning, organization and realization of protection of the national energy, i.e. critical infrastructure. As one of the pillars of the defense system, the Strategy emphasizes the development of the operational capabilities of the Army of the Republic of Macedonia, in two directions related to the security of energy infrastructure. The first is the support of the police and other state institutions in critical infrastructure protection and support in dealing with the consequences in the event of a terrorist attack, while the second is the support of state institutions in case of natural disasters and epidemics, technical and technological and other dangerous and crisis conditions/situations (Chaminski, 2017: 168).

6.4.2. Law on Crisis Management

The leading role of the Government in the process of protecting the critical, i.e. energy, infrastructure is also defined in the Law on Crisis Management that regulates the crisis management system in the Republic of North Macedonia (Law on Crisis Management, 2005). In addition to the Government and other state administration bodies and state authorities, the ARM and the protection and rescue forces, public enterprises, public institutions and services, as well as trade companies, can participate in prevention, early warning and dealing with crises. They have an obligation to protect and save the employees, the persons on spot and the material goods, as well as remove the consequences of the crisis situation. Although there is no explicit emphasis on the term, however – when it comes to energy operators – it is understood that “material goods” represent the energy infrastructure they manage. In addition, the ministries and other state administration bodies and municipalities, public institutions and services, as well as companies of special importance for operating in crisis situations, have an obligation in their acts for organization and systematization to establish jobs for the preparation and execution of working tasks related to prevention and rescue in a crisis situation. According to Article 12 of the Law, a Steering Committee, an Assessment Group and a Directorate / Centre for Crisis Management are established within the crisis management system. In addition to the measures and activities undertaken by the Steering Committee in a crisis situation, it has an obligation to provide timely, high-quality and realistic assessment of the threat to the security of the Republic

from the risks and dangers. Given the fact that it is composed of the ministers of interior, health, transport and communications, defense and foreign affairs, then it can be undoubtedly concluded that the government's leadership in the critical infrastructure protection is not at all disputed. In addition to the Steering Committee, The Assessment Group is also a governmental body comprised of the Directors of Public Security Bureau, the Security and Counterintelligence Administration, the Intelligence Agency, the Directors and Deputies of the Directors of the Crisis Management Centre, and the Directorate for Protection and Rescue, the Deputy Chief of General Staff of the ARM and the Head of Security and Intelligence Service in the Ministry of Defence. As a body whose leader is appointed by the Government of the Republic of North Macedonia, the Assessment Group has a permanent task – not only in case of a crisis – to assess the risks and dangers to the country's security, and to propose measures and activities for their prevention, early warning and in the end to deal with the crisis situation. The Assessment Group submits the results and conclusions to the Steering Committee, the President of the Government, the President of the Republic and the President of the Assembly. The Crisis Management Center is an independent authority and holder of the overall support of the Steering Committee, and the Assessment Group that provides continuity in the inter-ministerial and international cooperation in crisis management, prepares and updates a unique assessment of the risks and dangers for the security of the Republic of North Macedonia. As an operational expert body, which manages the activities for prevention and dealing with crisis situations, a Headquarter is formed within the Centre, consisting of representatives of the bodies involved in the work of the Steering Committee. Based on the foregoing, it can be concluded that the Law delegates the responsibility to each of the institutions involved in the organs and bodies in the crisis management system to undertake measures and activities for collecting information and identifying security risks and dangers, including those which endanger the security of energy infrastructure. Within the legal framework and authorizations, the institutions covered by the crisis management system, based on their assessments, determine the objectives, tasks and implementation of the necessary actions for prevention, early warning and crisis management. Among other things, the participants in the crisis management system are obliged to mutually communicate, coordinate and cooperate with the Centre upon the performance of the duties determined by the Law. For the purpose of planned, timely, expedient and coordinated decision-making, directions and recommendations for undertaking measures for prevention, as well as for the most optimal handling of the crisis situation, an assessment is made of the threat to the security of the Republic of North Macedonia from all the risks and dangers, that is adopted by the Government. As for the implementation, that is, the implementation of the provisions of this Law, the Crisis Management Centre prescribes inspection supervision in the state administration bodies, municipalities and other elements of the public and private sector and provides for appropriate penal provisions in the event of non-compliance with the decisions and other measures prescribed by the Law on Crisis Management. (Chaminski, 2017: 168-171)

6.4.3. Law on Protection and Rescue

Protection and rescue, is a matter of public interest for the Republic of North Macedonia and is organized and carried out not only by state and administrative bodies, but also by all public institutions, trade companies, including energy operators. According to the relevant Law, the protection and rescue system is realized through a number of measures and activities, including: observation, detection, monitoring and study of the possible dangers of natural disasters and other accidents; undertaking preventive measures, reporting and warning; determining and implementing protective measures; supervision of the implementation of protection and rescue; identification and assessment of hazards; preparation of the assessment of threats from natural disasters and other accidents and plans for protection and rescue and updating thereof, etc. In addition to the natural disasters, the stated measures and activities are also undertaken for assessment and prevention of other accidents. The Law defines them as events that result from certain overlooks and errors in the execution of everyday economic and other activities, as well as carelessness in the handling of dangerous goods and means for production, storage and transport of such goods (fires, major accidents in road, rail and air traffic, mine accidents, industrial accidents caused by explosions and other technical and technological reasons, radioactive rains, dust and sludge, spills of oil and oil derivatives and other toxic chemicals, explosion of gases, flammable liquids and gases and other flammable substances which create explosive mixtures with the air and other explosive materials of a larger size). Although asymmetric threats are not explicitly listed in the Law, nevertheless there is a high likelihood of “deliberate overlook of mistakes” (sabotage or diversion) in the handling of the listed dangerous goods, some of which are primary or final products of the energy sector of the Republic of North Macedonia. The following eight principles on which the protection and rescue in the Republic of North Macedonia is based, in terms of energy infrastructure, are the most significant: everyone has the right to protection and rescue from natural disasters and other accidents; the Republic of North Macedonia, municipalities, public enterprises, institutions and services and trade companies are obliged to timely organize and undertake preventive and operational measures for protection and rescue from natural disasters and other accidents; any natural and legal person, in accordance with the Law, is responsible for failure to implement the foreseen protection and rescue measures, etc. Of particular importance for the protection of energy infrastructure is the principle that obligates the security system institutions, and the public and private sector companies (including the energy operators) to organize and undertake, above all operational measures, to which the strategies for critical infrastructure protection of modern democratic states have a key role in the process of achieving the goals of the respective national strategies. The planning of the protection and rescue is realized on the basis of the National Strategy for Protection and Rescue adopted by the Assembly upon proposal of the Government of the Republic of North Macedonia. In view of organized implementation of the protection and rescue, all participants in the system adopt a Plan for protection and rescue from natural and other disasters. The Protection and Rescue Plan is prepared on the basis of the assessment of threat of natural and other disasters on the territory of the Republic

of North Macedonia, while for the needs of the private sector, including the energy operators, the assessment is adopted by the managing body. Accordingly, it can be concluded that the assessment of the endangerment of privately owned energy providers – according to the available information – is adopted by the management, on the basis of which is adopted the protection and rescue plan after which it undertakes the further measures and activities for securing the infrastructure from natural disasters and other threats (Law on Protection and Rescue, 2012).

6.4.4. Law on Energy

The Law on Energy is another legal act that coincides with the primary responsibility of the Government of the Republic of North Macedonia - security and protection of its citizens. Reliable, safe and quality supply of consumers with energy and fuels, creation of an efficient, competitive and financially sustainable energy sector, and protection of the environment from negative impacts in the performance of certain activities in the field of energy, are part of the main goals of this law (Law on Energy, 2018).

The Law on Energy is the only law that covers the concepts: security, protection, energy (fuel types) and infrastructure. Under the term “security”, the Law on Energy defines the ability to ensure the protection of the health and life of people, protecting the environment and property by undertaking technical and other types of safety measures in the production, transmission and distribution of energy or fuels. In addition to the various types of fuels, the Law defines most of the components of the energy infrastructure, such as gas pipeline, oil pipeline, distribution network for electricity, power system, energy facility, energy sector, operator, electricity producer, etc. In addition, the Law regulates numerous rights and obligations that energy operators should undertake in order to protect the energy infrastructure and security of supply not only to citizens, but also to the institutions of the national security system. According to the Law on Crisis Management, the operators of the transmission and distribution systems of the appropriate type of energy or fuel are obliged to prepare operation plans for crisis situations and submit them for approval to the Ministry of Economy. Furthermore, distribution system operators are obliged to adopt and publish distribution rules which, inter alia, regulate: the technical and other requirements for the safe and secure operation of distribution systems; measures, activities and procedures in case of disturbances and major accidents; prescribed safety measures and so on. Furthermore, the Law provides for strict security measures that potential investors in the energy sector must undertake as a prerequisite for obtaining authorization for the construction of energy facilities. These measures relate to the safety and security of the energy system, facilities and appropriate equipment, public health protection and safety, and environmental protection. Although there are adequate legal bases and obligations for protection of the energy, i.e. critical infrastructure in which the central government plays the key role, the Republic of North Macedonia significantly lags behind the type and effectiveness of the legal regulations for critical infrastructure protection of the EU and NATO Member States, as analyzed in the previous chapter. As a candidate country for full-fledged membership

in the EU, the Republic of North Macedonia should follow the steps that the Union and its members undertake in order to protect the critical infrastructure. Therefore, the Government of the Republic of North Macedonia must first define the critical infrastructure, and then proceed with preparation and adoption of a Program for the Protection of National Critical Infrastructure as a basis for the development of an effective strategy for its protection. The Program should be the result of a constructive cooperation that must be established and maintained between the private sector – including energy operators – and the competent governmental institutions at the state and local levels, not only in crisis but also in peaceful conditions. The main goal of this cooperation is to create an operational and effective national framework for joint action and build elastic and stable critical infrastructure, following the example of the organization of organs and bodies in the crisis management system. The preparation of a draft strategy for critical infrastructure protection, involving competent governmental institutions, operators and private sector companies, as well as experienced experts in the area of official infrastructure security, is the next step in the process of adopting an effective strategy for protection of energy, i.e. critical infrastructure. The purpose of the draft strategy is to develop and define a centralized, integrated and progressive strategy that will involve voluntary participation of industrial, energy and other private sector operators, as well as competent institutions from the central and local government. The desired outcome of the strategy is sufficiently elastic and immune – on security risks and threats – critical infrastructure that will enable citizens to have continuous and guaranteed access to basic services, including the supply of the necessary energy resources. One of the guiding principles of the strategy is raising awareness among energy and industrial operators and central and local governments of the need to protect the national critical infrastructure, as well as the need for full and permanent integration of intelligence and security assessment into crisis management plans.

If a comparison is made between the Crisis Management Law, the Law on Protection and Rescue and the Energy Law, it can be concluded that public enterprises, trade companies, industrial facilities and energy operators, can voluntarily and contractually participate in prevention, early warning and dealing with natural and security risks and hazards. However, without an operational framework for cooperation, the institutions of the national security system and the management of energy operators are unable to effectively implement and coordinate the measures and activities for protection of the energy infrastructure. Addressing this problem should not be perceived solely as a national problem, but it is an obligation that the state has as an aspirant for full membership in the EU and NATO. Energy operators must have sufficient information necessary for relevant security assessment on the basis that will plan and implement the necessary measures for infrastructure protection. This applies in particular to asymmetric threats for which energy operators have neither capacity nor legal powers to collect intelligence of such character. Therefore, the creation of a common integrated approach in the function of energy infrastructure security should be equally important and legal imperative, both for the Government and the energy operators. (Chaminski, 2017: 172-175).

6.5. Elements and Model of a Strategy for Energy Infrastructure Protection

The modern concept of energy infrastructure protection, as an integral part of national strategies for critical infrastructure protection, consists of a series of consecutive and interconnected elements that regulate the security of the energy sector as the main instigator of the economic and development policies of modern democratic states. Today, almost all parts of the private and public sector depends on the infrastructure that provides the necessary energy resources for its smooth and safe operation. Therefore, the focus of critical infrastructure protection is precisely the energy facilities that are necessary for the functioning of the political, social, economic and security processes in the society. In planning the elements of the Strategy for Energy Infrastructure Protection, whether it will be an independent or integral part of the Strategy for Critical Infrastructure Protection, it should be taken into account that every segment of the energy sector in the Republic of North Macedonia consists of a complex physical, computer, institutional, functional and personal structure whose functioning is impossible without the use of modern communication systems and the Internet. Most of the facilities for electricity generation, transmission and distribution are on the surface of the earth and are visible. Excluding rail and road transport, as well as control towers, the infrastructure for transmission and distribution of natural gas and oil is located below the surface of the earth and (with certain exceptions) it is not visible but is marked. Therefore, a unique methodology for identifying energy objects, systems and functions that have critical significance for the state and priority in terms of their protection should be developed. For that purpose, it is necessary to create a comprehensive, spatial and temporary updated database for precise determination of critical facilities, systems and functions, as well as a specific division of responsibilities between the private and the state sector. The risk of an attack on the energy infrastructure varies with the value and importance of the capacity (production, processing, storage, transport – oil pipeline, gas pipeline, transmission line – distribution, etc.). In the recent years, energy infrastructure has become a legitimate goal for global terrorist organizations as well. The accelerated process of globalization and the inevitable international trade in energy resources has further increased the risk of terrorist attacks on energy infrastructure. Although the Republic of North Macedonia and the wider SEE region have not faced direct terrorist attacks, however, the attack and disabling of the energy infrastructure of the countries where they originate or through which the energy resources transit can have a serious impact on the national energy security and economic development of the country. In addition to financing their own activities, terrorist organizations are trying to cause serious damage to the energy infrastructure with armed or cyber-attacks from a distance in order to create panic in the society, halt industrial production and, above all, stop the transmission of electricity, oil and oil derivatives. In terms of threats, the various elements of the energy infrastructure of the Republic of North Macedonia are characterized by varying degrees of vulnerability. The threat to security of certain energy facilities can result in a serious ecological disaster, although they are located in a relatively small area that physically can be easily secured. The oil and petroleum production sector, as

well as the natural gas sector, is characterized by a spatial infrastructure whose damage can lead to a disruption of the supply, exhaustion of state reserves and reduction of economic and defense capabilities. The situation is similar with the power sector whose main weakness pose its centralized automatic management and the lack of capacities for accumulation of necessary quantities of electricity. Considering the fact that the energy infrastructure has a great importance for the economic and security situation of the Republic of North Macedonia, its security is essential. In addition to terrorist threats, the energy infrastructure can be exposed to various types of threats that must be taken into account, both in the analysis and in assessment of risk and threats, as well as in defining security and preventive measures. These include natural disasters, technological accidents and human errors that can seriously compromise, cause major damage, or destroy certain sectors of the energy infrastructure of vital importance for the population and society as a whole. It can cause the so-called domino effect that has the potential to paralyze multiple sectors of critical infrastructure of the state, cause enormous damage to the national economy and loss of confidence in the political leadership of the state. In this context, the owners of the energy capacities and the institutions of the system, although they cannot fully guarantee the safety of the energy infrastructure, in accordance with the legal regulations of the Republic of North Macedonia, they are obliged to take appropriate and timely measures to reduce the risk of damage to the infrastructure and re-establish the supply of the necessary energy resources under favourable conditions.

Since the security of energy infrastructure is a common task of the government and the energy operators at the national and local level, their efforts should be directed towards raising the level of its protection on the territory of the state by undertaking appropriate and mutually coordinated measures. After identifying critical parts of energy infrastructure and assessing risk and threats, prevention is the fundamental measure in the function of protecting energy infrastructure. In case of damage, an effective crisis management plan and preparedness of the energy operators are necessary for timely recuperation of the affected energy capacity in a functional state. To this end, according to the updated security assessments and experiences of the countries of the international community, it is necessary to develop – legally prescribed – standards for protection that will provide a sustainable energy infrastructure, immune to modern security threats. The consistent application of preventive measures, the standards for protection and their proper management in the form of a crisis management cycle for the energy infrastructure, represent the basic guarantee for effective protection of the energy infrastructure of the Republic of North Macedonia. The biggest requirement that must be fulfilled for achieving the stated strategic goals is the need for continuous exchange of information and cooperation between government institutions and energy operators. Without this condition, the implementation of the strategy for energy infrastructure protection cannot be expected in real terms, since it includes a set of plans, programs, measures and instruments for coordination and promotion thereof, both by governmental institutions and energy operators.

Based on the findings obtained from the comparative analysis of the strategies for critical infrastructure protection of some of the EU and NATO Member States

and the current legislation for energy infrastructure protection of the Republic of North Macedonia, one can conclude that the model of the National Strategy for Energy Infrastructure Protection – individually or as part of a national critical infrastructure – represents a whole composed of the following interconnected and dependent elements:

- Strategic goals and interests of the state in relation to energy infrastructure, defined in the National Security Strategy;
- Harmonized legislation;
- Defining main elements of critical / energy infrastructure and sharing responsibility;
- Assessment of security threats, risks and vulnerability of elements of energy infrastructure;
- Determine the strategic goal of the strategy – effective protection of the critical / energy infrastructure;
- Cooperation, coordination and exchange of information between the parties involved, and
- Implementation.

In addition to identifying the objectives of energy infrastructure protection, the proposed model sets out two levels of decision-making a political level and a level of special sectors of critical infrastructure.

The National Security Strategy and Critical Infrastructure Protection Strategy are articulated within the first level, while within the second level, the public and private sectors – jointly – create the specific objectives, measures and activities for the protection of sectors of critical infrastructure, including the energy sector as well. According to the proposed model, critical infrastructure protection objectives are set at the highest strategic level and are defined within the national security strategy. In addition to the objectives of protection, the comprehensive principles for critical infrastructure protection are defined at this stage. The next step is to create strategies for critical infrastructure protection that emphasize the specific sectors and sub-sectors of critical infrastructure, and the principles of protection (such as information exchange, private-public partnership, etc.) are implemented and further processed and concretized. This step leads to the process of transferring the strategy from a political, to the level of separate sectors. In other words, it comes to application of the objectives and principles for critical infrastructure protection – developed at a political level – are applied in the specific / separate sectors, where the public sector and private sector operators communicate and exchange information and experiences for the safety of sectors and sub-sectors from the identified critical infrastructure. In the level of separate sectors, the objectives and principles of protection are adapted to the specific needs of the identified and designated sector and sub-sector of critical infrastructure. This results in the creation of plans to protect each sector of critical infrastructure, including the energy sector. At this stage, the role of energy or industrial operators in the private sector is to manage sectors of critical infrastructure, co-operate with

the public sector, and articulate goals and measures to achieve the required level of infrastructure protection. Within the public sector, dedicated agencies (such as the Crisis Management Centre, the Protection and Rescue Directorate, etc) share the national legal obligations to critical infrastructure operators and create platforms for the exchange of information and partnerships.

In addition to the described critical infrastructure protection model, which is based on the traditional “top-down” approach, there is a “bottom-up” approach that using feedback information, informs the political level of the effectiveness of objectives, principles and measures for protecting sectors of critical infrastructure. At both levels, the wider information provides insights and influence on the identified goals, principles, measures and means for critical infrastructure protection sector, both by the public sector institutions and by the national / local agencies as well as by the operators of the private sector and academic community. Accordingly, it can be concluded that the proposed Draft Model is an example of a dynamic, interactive, and, above all, an effective process involving all parties that play a role in the process of defining, promoting and implementing goals, principles and measures for energy infrastructure protection as a key sector of the critical infrastructure of the Republic of North Macedonia. (Chaminski, 2017: 175-181).

Conclusions and Recommendations

As we have already mentioned, critical infrastructure is a platform for maintaining the development of every society and state. Hence, the Government should be involved in the critical infrastructure protection system as a legislator that brings laws and by-laws and has the task of authorizing certain ministries to be coordinators of the entire system.

The Government provides a strategic framework that is essential for the successful functioning of the system, cooperation, communication and coordination of all involved actors. The Government also determines (by special decision) sectors of certain critical infrastructures in order to provide a holistic approach to protecting and reducing adverse impacts in case of a threat to critical infrastructure.

After the Government, the next most important actor is the coordinator (designated ministry) of the entire system for critical infrastructure protection. There are various examples and practices on which body is appropriate for this role. In many European countries, this function has been assigned to the Ministry of the Interior. Hence, there are different solutions and practices, but each country should recognize the most appropriate model on its own. From a comprehensive analysis, we propose that the Ministry of Interior of the Republic of North Macedonia be the coordinator of the whole system for critical infrastructure protection.

If the Ministry of the Interior is a system coordinator, it will have the role to communicate directly with all actors of the system, with international actors and submit reports to the Government.

An organizational approach to the implementation of critical infrastructure protection in the European Union and countries that strive towards full membership

(such as the Republic of North Macedonia) is given in Directive 2008/114/EC on the identification and establishment of European critical infrastructures and the assessment of the need to improve their protection – the main document of the European Union for critical infrastructure.

In order to be resolutely committed to the implementation of the above, we provide several initial recommendations:

1. In the establishment of the critical infrastructure protection system, it is necessary to have the strategic framework as a starting point. It is necessary to incorporate the strengthening of the resistance and the critical infrastructure protection into one of the Strategies of the Republic of North Macedonia. There are several possibilities:
 - A. *If the need for revision of the existing or development of a new national security strategy is to be established, it is necessary to include a section for critical infrastructure in the strategy. It is indisputable that the National Security Strategy should include a section on critical infrastructure.*
 - B. *If there exists or is in the development of a Cyber Security Strategy, the critical infrastructure can be mentioned there. Such a Strategy was developed in 2018 and contains sections that aim to protect the critical information infrastructure as part of the overall critical infrastructure. Furthermore, an action plan for protection of critical information infrastructure has also been adopted. (National Strategy for Cyber Security of the Republic of Macedonia, 2018-2022).*
 - C. *The third solution is a proposal for the preparation of a Strategy for Critical Infrastructure Protection.*
2. Normatively, the drafting of the Law on Critical Infrastructure Protection can be proposed. While it does not pass all the foreseen phases of its adoption, the critical infrastructure topic may be temporarily regulated under any other law or by-law (the assumption is that the procedures for this are shorter and faster can be temporarily regulated).
3. When drafting the normative regulation for critical infrastructure, the recommendation is to regulate primarily the areas of energy and transport – these two segments are required by the European Union from its Member States and those that aspire to access the Union. If other critical infrastructure sectors are involved, the experience of Croatia can be repeated at the very beginning to slow down and complicate the process. Therefore, it is recommended to start with the energy and transport sectors.
4. In the forthcoming normative solutions (law and by-laws), the possibilities for regulation of the European critical infrastructure should be foreseen.
5. In the law and by-laws, the security coordinator must be mentioned, which is a key figure that will be responsible in all bodies and organs for the activities regarding the critical infrastructure.
6. In the law or by-laws, to emphasize the place and role of the public-private partnership.
7. In the law or by-laws, to emphasize education, and training.

8. The place and role of the newly established Critical Infrastructure Protection Centre is extremely important. For these reasons, perhaps the Ministry of the Interior is a good choice to be a state coordinating body for this process, because the Centre should collect data and coordinate activities. Also in the law or by-laws, it is important to state that the work on critical infrastructure protection will take place through the Centre for Critical Infrastructure Protection.
9. As far as the classification is concerned, the lowest possible classification should be put in place so that we do not get into the situation to block the process from the very beginning.
10. In creating the strategic solutions and the legal solution, an inter-ministerial group should be established that will include a wider circle of experts, from universities, ministries, chambers, the private sector.
11. After the adoption of the law, further by-laws should regulate individual procedures.

After the Strategy and the Law, it is necessary to begin the establishment of the Critical Infrastructure Protection SYSTEM. The SYSTEM is built by education, workshops and familiarization of all stakeholders in that process. It is necessary to make a five-year action plan.

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