

CIVIL SECURITY: ARCHITECTURAL APPROACH IN EMERGENCY MANAGEMENT TRANSFORMATION

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Abstract: The article presents the major findings of a comprehensive study (White Paper on Civil Protection) accomplished by the Center for National Security and Defense Research (CNSDR) in the Bulgarian Academy of Sciences (BAS). The research is presently further developed within the framework of a NATO Science for Peace Project SFP-981149 for building new capabilities in Decision Making Support for the Bulgarian Security Sector. The main goal of this article is to assess the status and prospects ahead of the system for protection of population and critical infrastructure. The fundamental principles of the Concept for Civil Security of the Republic of Bulgaria have been formulated within the context of the establishment of an integrated security sector. An institutionalized civil security system is considered “the third pillar” of the security sector in Bulgaria. Three main alternatives for development of civil security system are put forward. The first alternative is a result of a narrow interpretation and application of the newly adopted Crisis Management Act. The second alternative offers a broader interpretation and application of the Crisis Management Act. This alternative envisages maximum interdepartmental coordination – “a quasi ministry, whereas a ministry is not actually established.” The third alternative envisages the establishment of a new Ministry of Civil Security. The development of a Center of Excellence in Security Sector Transformation in Bulgaria is proposed to provide scientific support to the effective transformation of the civil security system and the implementation of the Crisis Management Law.

Keywords: New Risks and Vulnerabilities, Emergency Management, Civil Security, System Architecture, Security Sector Transformation.

Introduction: Vulnerability and Security in the New Age

There is a clear shift from military to nonmilitary threats to security and increasing awareness of the vulnerabilities of modern society to disasters and emergencies, terrorist acts and organized crime.

In such a security environment it is more and more important to have an integrated approach to security and an integrated security sector to cope with the new challenges. Participation of civil society and focus on security of the citizen and society as key element of the emerging civil security concept is best visible in the area of emergency management / civil protection.

Different events are possible on the Bulgarian territory, which require rapid reaction of the security system:

- *Natural disasters* – earthquakes, floods, drought, landslides and landslips, stormy winds, twisters, sandstorms, forest and field fires, hailstorms, snowdrifts, ice storms, sea storms, centers of infections and human, animal and plant pandemic diseases;
- *Accidents* – at risk sites operating with nuclear, radiation, explosive and highly inflammable substances, toxic industrial substances and toxic gases;
- *Emergencies* – cosmic, aviation, railway, road, at sea, and premeditated acts;
- *Terrorist acts*, as well as separate acts of organized crime that pose a direct threat to security of civilians and critical infrastructure.

Risks of different nature have been consecutively assessed with the help of the seven expert groups of the National Consultative Council with the Permanent Committee for Protection of the Population against Natural Disasters, Accidents and Emergencies (PCPPNDAE).

The possible causes of risk of radiation contamination are: violation of radiation safety rules; violation of safety rules; incompetence to work with sources of ionizing radiation (SIR); human error; theft; terrorist act. The possible consequences of *radiation risks* are: damages to people – loss of human life within the zone of radiation damage, damage within the repository, damages to a different extent to the people across the entire territory of the country, local damages from SIR; damages to critical infrastructure – loss of huge power capacities in an industrial accident at a nuclear power plant; environmental damages.

Chemical risks come mainly from industrial accidents when highly toxic substances are produced; there is a risk of such accident in more than 350 companies in the pharmaceutical, metallurgic, chemical, textile and oil processing industries. The territory of the country is crossed by *oil and gas pipelines*, which together with the compressor stations and the natural gas repository near the village of Chiren are potentially highly inflammable and explosive sites. The territory of the country is also crossed by a major *artery for transport vehicles carrying highly toxic substances*, which, in case of a road accident, may cause environmental pollution or pose a threat to the life and health of the population. Road accidents and *technological accidents at*

sites operating with oil, oil products and natural gas may cause pollution and pose a real threat to the population. *Spills of mercury, pesticides and other chemicals*, as well as accidents related to the use and transportation of the abovementioned items could also result in pollution and real threat to the population. Oil spills along the Danube River and the Black Sea may have the same effect.

Biological risks leading to severe infections-related morbidity for the period 1950-1959 stood annually at 1402,86 o/oooo (104 135 registered cases). The next period of 34 years (1960-1993) marks a downfall in morbidity rate and eradication and elimination of a number of contagious diseases (hydrophobia, classical typhus, diphtheria, poliomyelitis). The average rate of morbidity for the period stands at 1208,43 o/oooo as a result of improvements in the etiological diagnostics, the expansion of the immunization program, and planned implementation of anti-epidemic and prophylactic measures. In the 1970s, there was immediate risk of importing some very dangerous infections such as smallpox and cholera from neighboring countries (Federal Republic of Yugoslavia and Republic of Turkey). The period 1994-2003 is characterized by a tendency of decreasing morbidity rate from highly contagious diseases – from 1043 o/oooo in 1994 to 648 o/oooo for 2003. The average annual morbidity for that period stands at 910,82 o/oooo.

Seismic risks are caused by different natural (and in some cases anthropogenic) factors, suddenly manifested short movements of Earth's surface of different strength. They stand out for: very hard to predict (and only partially) or unpredictable manifestation; very short duration (within tens of seconds) of seismic blasts; different depth of seismic centers; inconstant and huge by rule intensity of seismic energy; regular or irregular recurrence of seismic processes; relative localization of seismic effects in seismic zones and belts on Earth's surface; relation between the earthquakes and the strongly rifted sections of the lithosphere.

The earthquakes of average and big magnitudes may cause many different in scope and nature ecological problems related to: the destructive power of tsunami waves along seacoast areas; damage or destruction of dam walls of artificial reservoirs; damage or destruction of warehouse facilities, reservoirs or earth gas pipelines, liquid fuels or other chemical substances; damage or destruction of electric transmission lines, etc. The heaviest situations could emerge in the most densely built-up central urban part, industrial areas of big cities and the lots of old construction not compliant to the seismic requirements.

Landslide risks are related to some of the major unfavorable phenomena that form the potential geodynamic danger. Landslides are scattered irregularly across the territory of the country and there are regions of higher concentration.

The *climatic, meteorological and hydrological risks* fall into two groups of risk phenomena: natural and anthropogenic. The “winter” and “summer” smog in cities, the thinning ozone in the stratosphere and the “global warming” are among the highest risk phenomena of anthropogenic nature. A possible climate change is related to potential risks for agriculture and forestry, water resources and healthcare.

Significant and intensive precipitation may cause floods in many possible regions across the country. Considerable warming during the second half of winter and the start of spring, accompanied by rainfalls and fast thawing of snow cover may cause small and medium water basins to overflow and other unfavorable phenomena.

Strong winds, such as foehn, squall, strong turbulent wind, and twister, cause breakdown in communications, damages and collateral difficulties (possibly victims). Probable regions are the entire territory of the country. Meteorological situations leading to fires are the continuous droughts accompanied by high temperature and low humidity.

Risks related to infrastructure have acquired greater significance for civil security. The draft CM Law defines “critical infrastructure” as a system of facilities, services, information systems, whose halting, defects in operation or destruction may have serious negative impact on the health and safety of population, environment, national economy or on the efficient functioning of the state administration.

In some states, the defense system and management of emergencies have been explicitly defined as part of the critical infrastructure. Other countries underscore the critical importance of the functioning of administration, healthcare system and public-order enforcement systems.

These are real risks and they are not only on our territory but everywhere, so we have to be prepared to react as well as to work on reducing vulnerabilities (mitigation), to perform preparedness / prevention activities and to have capable programs for reconstruction.

This article is based on a research project of CNSDR-BAS ordered by PCPPNDAC in order *to assess with the participation of independent experts the current state and prospects ahead of the system for protection of the population and critical infrastructure, to develop a concept for its expansion and thus assist PCPPNDAC and the other competent authorities in the application of the just approved Law on Crisis Management and possible drafting of the Law on Population and Critical Infrastructure Protection.*

The research performed is of a *methodological, conceptual and recommendatory* nature. After the relevant administrative decisions are taken by the competent officials, *a decision may be drafted by the Council of Ministers for the adoption and develop-*

ment of legislation and other regulations, for the organization of training at central and regional levels within the framework of a comprehensive concept for the system for protection of the population and critical infrastructure.

The immediate importance of the presented project is determined by:

- The reform in the security sector has reached the stage of intergovernmental coordination and integration, at which the system for population and infrastructure protection, within the context of the currently drafted Law on Crisis Management, is to play a key role in restructuring of the sector.
- The assessment of the risk environment and particularly of terrorist threat, infrastructure vulnerability, gradual privatization of major infrastructure sectors, increased international commitments, and the cross-border character of modern threats require a modern review of the system.
- The actual NATO membership and the forthcoming EU membership require a high extent of harmonization. In fact, the civil protection system is a top priority area of cooperation between EU and NATO in the Black Sea region.
- The completed Strategic Defense Review makes it possible to reassess and re-directed a number of issues related to the use of civil resources, defense industry, strategic partnership, etc., which opens new opportunities for projects for modernization of the system for civil protection within the context of army, police and infrastructure sectors modernization.

The main contributions of the accomplished study are in:

- Definition of the concept of “Civil Security” as the Bulgarian interpretation of the concepts of Homeland Security, Civil Security and Societal Security, discussed within the Euro-Atlantic community in the context of establishing an integrated security sector.
- Application of the architectural approach leading to comprehensive description of alternative crisis management arrangements, assessment of alternatives and selection of a “best” architecture, and, finally, defining main steps of the transition to the future architecture.
- Efficient use of the brain-storming method and optimization methods for decision-making regarding the development of population and critical infrastructure protection system.

Concept of Civil Security as Third Pillar of Modern Security Concepts

The analysis has focused on a number of different notions for naming of the unified system for management of crises caused by natural disasters, accidents and catastrophes and for protection of citizens and infrastructure: civil defense; security of living

environment; public security (*societal security* has been adopted in Scandinavian countries and is considered an analogue of the American *homeland security*); protection of the population (citizens) and infrastructure; security of citizens and infrastructure; civil protection; *human security*; *civil security*.

The most recommended term within the Bulgarian context is “civil security” (adopted, for example, in France and Belgium). The creation of a Bulgarian concept of civil security has sought a balance between the approach of the US and different European countries by taking into consideration the experience and the situation in Bulgaria with the aim to establish the best possible environment for efficient implementation of the Law on Crisis Management.

The civil security system could be established as an independent third “pillar” of the security sector, which is equally important to the other two “pillars” of security – internal security and public order (mainly provided for by the Ministry of the Interior) and external security and military operations (mainly provided for by the Ministry of Defense).¹ Consequently, it should have a well-defined normative regulation and a solid institutional dimension. There is a possibility that social relations connected to civil security can be regulated by the same Law on National Security.

The civil security system is built to a high extent with active civil participation and civil control as compared to the other elements of the security sector. This presupposes also a high extent of transparency, accountability, and, in the long run, democratic quality of this key element of the security sector. The establishment of an efficient civil security system presents an opening for the maintenance of well-balanced civil-military relations and clear-cut distribution of obligations during different types of crises.

The civil security system should be based on the principle of decentralization. Special importance is rendered to the local units of civil security (controlled by the local authorities) that give the initial response at the rise of threats related to civilians and infrastructure. This characteristic of the system for civil security corresponds directly to the process of establishing an electronic government (e-government), including at local level. If the transformation process is well-managed, “security” as a service could be provided along with other administrative services as a “one-stop-shop” service (on the Internet or a single emergency and non-emergency phone number). Much could be borrowed in this respect from the experience of the Emergency Call Centers established at all levels of the administrative-territorial units in the US.

The principle of decentralization does not eliminate the need of an overall coordination and control implemented by the “central units” of the civil security system – the National Centre for Crisis Management, the State Agency for Civil Protection, and the Permanent Committee for Protection of the Population against Natural Disasters,

Accidents and Catastrophes (PCPPNDAC). An important role in the formulation and management of the Plan for transformation of the civil security system could be rendered to the National Research and Coordination Council to PCPPNDAC.

As a novel concept, the Civil Security Concept is emerging on the basis of two main prerequisites. First, the process of globalization is changing the essence and the role of the state as we know it. We are unable to predict how states and nations will look like in 2050, for instance. The transformation of “traditional” states and nations necessitate transformation of the security sector as a core element of the traditional state. Civil security and human security are the answers that we can give to these global transformation processes from a 2005-perspective.

Secondly, it is a statistical fact that much more people are dying as a result of natural disasters, accidents, and catastrophes in comparison to the victims of terrorist acts or organized crime activities. We are unable to stop natural disasters and catastrophes, but we can optimize our emergency management system and minimize the negative effects. Precisely, this is one of the goals of the Civil Security Concept.

As every definition, the definition of civil security is a hard task that can only be achieved by a higher number of experts. Therefore, in this article we can only give some of the guidelines for a definition. Civil security means the following:

- *Better interdepartmental coordination.* If properly implemented, the broad interpretation of the Law on Crisis Management will lead to the establishment of a civil security system that is legally described as National System for Crisis Response. In this respect, the role of the National Crisis Management Center is crucial.
- *Active civil society participation in the provision of security.* The active civil participation is the connecting link between “traditional” civil protection and civil security. Nowadays security cannot be provided by the state itself. The engagement of civil society becomes indispensable. Civil society structures, NGOs, voluntary local formations as well as business organizations and the scientific community are the potential resource for the establishment of a third pillar of the security sector.
- *Good governance and effective democratic civil control over the security sector.* Participation is the best opportunity for proactive control.
- *New strategic culture of civil society.* The establishment of a civil security element of the security sector is a challenge to the maturity of civil society. The ability of civil society to fill in the vacuum left by the diminishing traditional state fast before organized crime is vital.

The successful transformation of the population and critical infrastructure protection system into a civil security system will be both a test and a major step towards the establishment of an integrated security sector. Even in the case when the civil security system is not developed as a “separate pillar,” the Civil Security Concept could become the conceptual basis for a successful security sector transformation process. In this sense, the Civil Security Concept could be interpreted as an upgrade of the Security Sector Integration Concept. Moreover, transcending beyond “national security,” the Civil Security Concept gives the opportunity to formulate a Security Sector Maturity Model applicable in the whole Euro-Atlantic geopolitical space.

Implementation of the Architectural Approach to Transformation Planning of Civil Security

Implementation of the concept of civil security requires serious transformation of the existing system for emergency management around the State Agency for Civil Protection and partner organizations as MoD, MoI, and other ministries (transportation, healthcare), local authorities, civil society, and business. A new architecture is needed and an enterprise governance mechanism to manage it. This is the reason to use the methodology of the architectural approach to provide comprehensive analysis, description of the existing system, development of alternatives and their assessment, selection of the end-state model, and planning of the needed steps for transformation.

Transformation planning requires the drafting of a model, goal, and criteria for the assessment of alternatives for the system for population and critical infrastructure protection. This general model is the starting point for the questionnaires for research on the current status, collection of data for future development and selection of a method for qualitative and quantitative optimization of the architecture of the system. The definition of the general model (an “empty” object-oriented model based on the architectural approach) of the system has to begin with a general description of the environment for development of the system at present time – political, economic, social and technological, as well as with an assessment of system’s current status (SWOT (strengths, weaknesses, opportunities, threats) and PEST (political, economic, social, technological) analyses). The second step should be the development of alternatives for improvement of the system, selection of a basic alternative and an action plan (or transformation plan) for attaining the target status (or the desired alternative).

The presented study has offered a number of alternatives differing in principle in the major parameters in the description of the two main aspects (layers) of the unified architecture of the system for population and critical infrastructure protection:

- Operational architecture – major risks, goals, working elements, links, information exchange;
- System architecture – main systems for surveillance, monitoring, early warning, alerting, decision-making and management, coordination and planning, reconstruction and prevention, as well as major logical building elements of these systems.

The main areas where different parameters for the alternative models are sought are: risk environment and types of operations of the system for population and critical infrastructure protection; main capabilities necessary for population and critical infrastructure protection; system structure and distribution of obligations and the necessary operational capabilities in compliance with the elements of this structure; partnership among the organizations within the system for population and critical infrastructure protection and international cooperation; system management and forms of public-private partnership; establishment of technical systems – development and use; financial model of functioning of the system for population and critical infrastructure protection.

The optimization should be taking place at three levels:

- Formation of a full range of alternatives and expert screening for plausible options in order to establish a range of differing in quality and internally non-contradicting alternatives;
- Quantitative optimization of each alternative;
- Assessment of the alternatives (quantitatively optimized) and selection of a range of preferred (basic) alternatives.

Qualitative optimization of a mixed alternative could be preferred during the analysis of high-quality alternatives if there are some alternatives ranking close to each other following the complex of criteria.

A springboard for the formation of alternatives could be the description of the current status of the system for population and critical infrastructure protection with an analysis of the problems and alternatives.

The next step, after the formation of the ultimate range of basic (preferred) alternatives, is the analysis and synthesis of the steps of an action plan (transformation plan) for the transformation of the current state into a target state with transition through a number of intermediate states. The goal is to choose the optimal trajectory of transformation, to extract invariant steps and principles of action, which is to guarantee the success of the transition. Due to the limited time for this research and its preliminary character, the goal set is to achieve a strategy for transformation rather than a transformation plan, with a range of variation steps.

There is a whole set of internal and external conditions for implementation of the transformation. The most important internal conditions are as follows: a well-defined term of office and strong leadership, an efficient body for strategic planning and coordination (a system of the Planning, Programming and Budgeting type for the system for population and critical infrastructure protection) in the central government, as well as an efficient information system for management that ensures monitoring of key indicators of the transition and real-time response.

Mission of the system for population and critical infrastructure protection used in the study is:

*Development, maintenance and efficient use of capabilities for prevention, monitoring, due and adequate response and recovery after natural disasters, accidents and emergencies and other considerable negative impacts on the population and critical infrastructure.*²

This system has the following goal³:

Minimization of negative consequences.

Each alternative put forward in this study is assessed on the basis of a common goal. The proposed *Motto* of the system is:

From civil protection to higher security from and for Bulgarian citizens and society in the 21st century.

The criteria for assessment of alternatives, determined as a result of interviews and analysis of data, follow the PEST model similarly to the initial analysis of the status of the population and critical infrastructure protection system through SWAT analysis. The criteria are of the following classes: *political, economic, social, technological*, described in quantifiable terms in a special table for the experts participating in the assessment process.

When the trajectories for attaining the alternatives are defined, apart from the above-mentioned criteria, a definition is also given to “risk”—short-term, mid-term, and long-term—for achievement of the end goal. Each criterion is evaluated on the basis of its importance to the achievement of the goal while each alternative is evaluated for compliance with each criterion.

The cost of transition also plays important role during the development of the transformation plan. The cost is regarded as an additional criterion for selection of an alternative or formation of a multi-layer plan which includes the gradual implementation of various alternatives.

The elaboration of the alternatives is based on:

- Changes in the operational architecture through addition or exclusion of objects, links, and changes in the characteristics of the objects;
- Changes in the system architecture through addition or exclusion of objects, links, and changes in the characteristics of the objects.

Preliminary analysis could help in excluding entire groups of alternatives. The main alternatives are based on separate states of the system for population and critical infrastructure protection within the space of alternatives on the basis of the following “axes:”

- Scope of risks, goals, and corresponding capabilities (broad-narrow);
- Structure of the system for population and critical infrastructure protection (centralized-decentralized);
- Organization of the system for population and critical infrastructure protection (departmental-interdepartmental);
- Type of public-private partnership (strong-poor).

On an expert level, it is possible to add other high-quality alternatives based on difference in another area (apart from risks, structure, organization, and partnership) – specific financial model of operation, specific partnership schemes, etc.

The method for quantitative optimization of alternatives allows the selection of values for the key system parameters. The change of quantitative parameters (e.g., number of elements, centers, capacity) results in additional quantitative alternatives for each option differing in quality. Only the best quantitative alternative is chosen to participate in the general assessment and selection of a pool of quality alternatives.

The method for selection of alternatives differing in quality (already quantitatively optimized) that meet the goal of the system for population and critical infrastructure protection, the criteria for assessment of alternatives and for development and description of the alternatives in terms of the architecture model is implemented through their assessment and ranking compliant with objective methods set in the *Expert Choice* software.

The selected optimal architecture provides the basis for drafting a plan for transformation of the system for population and critical infrastructure protection and its subsequent operation.

The structure of the transformation plan includes:

- Goal of the transformation and criteria for success (factors for measuring progress);
- Stages of transformation and main goals;

- For each stage – steps taken by the corresponding contractors, deadlines, and implementation resources.

The strategy and vision determine the steps in the seven areas of achieving these parameters which are determined as optimal for the selected alternative for development of the system for population and critical infrastructure protection – i.e. who, what, when, how, where, how much, with whom.

1. Risk environment and types of operations of the system for population and critical infrastructure protection;
2. Main capabilities necessary for the protection of population and critical infrastructure;
3. Structure of the system and distribution of responsibilities and necessary operational capabilities compliant with the elements of the structure;
4. Partnerships between the organizations within the system for population and critical infrastructure protection and international cooperation;
5. System management and forms of public-private partnership;
6. Establishment of technical systems – development and use;
7. Financial model of population and critical infrastructure system.

The development of the financial model of the system for population and critical infrastructure protection is assessed, particularly in relation to point 7, following the adopted model of the system for population and infrastructure protection. It is also used to plan the financial policy including the financing of projects for modernization and prevention.

It is possible to present the plan as a network schedule (in *MS Project*) by presenting the steps (actions) of the different groups of participants in the process: National Assembly, government, minister in charge, partner administrations, other public and private partners, including in an international perspective. The management of the implementation of the plan is a key element.

The research and technological foundation is to a great extent independent of the alternative due to the uniqueness of established systems, the need to use them, when it is a matter of national security and consolidation of positions in NATO and EU on issues of population and infrastructure protection. The serious technological slow-down in equipment of systems and even staff training, the lack of research-and-development units could be overcome with the help of the Research Consultative Council and an efficient modernization plan.

Alternatives and Transformation Plan for Bulgarian Civil Security System

In order to facilitate the decision-making process in the national organization for civil / societal security, the research team designed, analyzed and tested through expert assessment a number of alternatives.

Initial basic alternatives were designed along the following axes of a hypercube:

- Scope of the countered risks and threats, respectively tasks and capabilities of the system;
- Level of centralization / decentralization from a territorial perspective and organizational hierarchy;
- Organization from administrative perspective – centralized (in one state “agency”)/ decentralized (network of agencies and other players);
- “Ownership” of the system, i.e. level of public-private financing, business and citizen’s participation.⁴

Thus, there are 16 boundary variants of the system for protection of the population and the critical infrastructure and a considerably higher number of interim variants. Therefore, the basic alternatives were explored and further elaborated under the following two hypotheses:

(A) The central governmental authorities will preserve considerable power and responsibilities within the system for protection of the population and the critical infrastructure for all basic alternatives; however, the responsibilities and the capacities of local and regional authorities for civil protection will be significantly enhanced. In this case, a centralized administrative structure will maintain administratively and operatively subordinated structures (forces) in several “regional centers” (in our case they could be six in the respective planning regions of the country; it is also possible that the separate structures specialize in different capabilities from a functional point of view), while at local level, the predominant role will be vested in the forms of civil participation for population and critical infrastructure protection, e.g. through structures of a “Civil Guard.”⁵

(B) For all basic alternatives, with the exception of alternatives 4 and 5—“Centralization based on the Ministry of Defense” and “Centralization based on the Ministry of the Interior”—the dominant tendency is that of joint public-private financing, i.e. sharing responsibilities for financing among the state, local budgets, NGOs, private business, including operators of critical infrastructure and services, insurance companies, citizens and legal entities.

Under these hypotheses, the research team selected six basic alternatives for detailed description and analysis.

Basic Alternative 1 – Optimization of the current organization

Alternative #1 envisages improvement of the current structure of the State Agency for Civil Protection and concentrates only on the optimization of the work of the existing agency and the coordination of its activities with other state agencies. In practice, this alternative does not lead to the establishment of a *system* for protection of the population and the critical infrastructure, or to the establishment of a civil security system. Basic Alternative #1 is mainly of an intradepartmental nature; it requires the least efforts and resources and, consequently, will lead to a slight change as compared to the current status. A “narrow” scope of risks and capabilities for this alternative means preservation of the current scope of the State Agency for Civil Protection. This alternative could be defined as *preservation of the status quo*.

From a functional perspective, Alternative #1 is targeted at bridging over the following problems in population and critical infrastructure protection: not sufficiently efficient model of commanding interactions and distribution of command information, i.e. a change in the hierarchical model used so far for exchange of information and coordination of decisions and actions; not sufficiently efficient prediction of risks, disasters, accidents and emergencies, i.e. improvement of prevention; lack of 100% coordination among rescue teams in different ministries, agencies and administrations (State Agency for Civil Protection, Ministry of Defense, Ministry of the Interior, medical teams, etc.).

A major weakness of Alternative #1 is that it will not neutralize the problems of interdepartmental coordination in time of disasters, accidents and emergencies. From an institutional perspective, Alternative #1 is based on a number of organizational and technological activities of the State Agency for Civil Protection, such as establishment of a Center for collection, processing and distribution of space information; establishment and maintenance of a central Register of critical infrastructure; establishment of a unit for psychological protection of the population in case of disasters, accidents or emergencies (possibly within the framework of the Information and Public Relations division of the State Agency for Civil Protection; optimization of the system for emergency management, particularly through developing capacities for field management.

Basic Alternative 2 – Optimization of the Operational Coordination

Alternative #2 envisages significant optimization of operational coordination among different units in charge of population and critical infrastructure protection. This alternative is part of the philosophy of the draft Law on Crisis Management. Its imple-

mentation presupposes the following steps: adoption of the Law on Crisis Management, establishment of a National Center for Crisis Management, the initial experience from the practical implementation of the Law and its “narrow interpretation” for a limited scope of risks. This alternative encompasses mainly two lines of activities: establishment of a crisis response system under the Law on Crisis Management, along with the National Center for Crisis Management to the Security Council at the Council of Ministers, Security and Crisis Management Councils with the Ministers and other central authorities of executive power, security and crisis management councils with the regional governors and mayors of municipalities, as well as crisis response forces; establishment of interdepartmental “mutual trust” among the structures of the newly-built system for response to crises, the “traditional” structures for population and infrastructure protection – the State Agency for Civil Protection, PCPPNDAC and the “traditional” power ministries (the Interior Ministry and the Defense Ministry).

In the case of this alternative, several organizations with different traditions and culture will coordinate their action plans for crisis situations. They are expected to regularly train the management and crisis situations response procedures within the framework of joint exercises. What is more, their actions in emergency situations will be controlled by a unified, integrated management system. “Narrow” scope of risks and capabilities under this alternative means preservation of the current scope of the State Agency for Civil Protection.

According to the research team, in Basic Alternative 2 the “operational coordination” between the State Agency for Civil Protection, the National Center for Crisis Management and the inevitable third parties (the Interior and the Defense ministries, as a minimum) will be accompanied by a “timid” application of the newly-adopted Law on Crisis Management and mutual testing of “partners,” and in the worst case the end result will be mutual blockage of separate activities. Due to the vague normative regulations, this alternative gives to the traditional power ministries the opportunity to take over the initiative in the system for crisis management, as well as to dominate the structures for citizen and infrastructure protection. This alternative could be defined as an alternative to the fragile interdepartmental balance. It requires certain vision and efforts for the implementation of the expected final results.

Basic Alternative 3 – Interdepartmental coordination of capabilities development and operations (maximum interdepartmental coordination, a prerequisite for integrated population and critical infrastructure protection)

In addition to the operational coordination, Basic Alternative 3 envisages the coordination of plans for development of capabilities for protection of the population and the critical infrastructure between several agencies (possibly of major participants

outside the executive power, too) and the fulfillment of those plans. The implementation of the alternative presupposes a broader interpretation and application of the Law on Crisis Management, including development and adoption of a number of additional normative documents. Alternative #3 assumes a higher degree of integration of the crisis response system and the existing structures for population and infrastructure protection. Key role in this alternative is played by the State Agency for Civil Protection, the National Center for Crisis Management to the Security Council, and PCPPNDEA. For a more efficient integration, the “power vice premier” may play a significant role. A permanent interdepartmental group or an administrative structure to the Council of Ministers may be set up with the “power vice premier.”

Several organizations in this alternative will coordinate not only their action plans for crisis situations, but will jointly draft plans for development of related capabilities, for use of financial means and for technological optimization (acquisition of new means and systems). What is more important, they will be supposed to coordinate the development of normative documents for use of the “forces,” means (statutes, instructions and other by-law regulatory documents) and their decisions for dislocation of “forces” and means; they will jointly use training ranges, storehouse facilities, different types of technical means and equipment; they will apply unified requirements to the training and preparation and will even use in coordination education, research and scientific resources. Thus, in practice, the organizations will be functioning within the framework of an integrated system for management, including for ongoing control of decision implementation with regards to developed capabilities, provision, preparation and delivery of new equipment. An “enlarged” scope of risks and capabilities in this alternative means enlargement of the present scope of the State Agency for Civil Protection and incorporation of new risks, capabilities and activities.

The implementation of this alternative may to a high extent require strong leadership, managerial experience and ability to accomplish the targeted goals and tasks.

Alternative #3 could be discussed as “almost a ministry, while a ministry is actually not set up.” Its implementation will to a large extent improve interdepartmental operational coordination, and, what is more important will help in the establishment of coordination development plans. The advantage of this alternative is that the protection of population and infrastructure and crisis response activities will be improved without the establishment of a new ministry, which otherwise will be very likely perceived as an “empty” and useless ministry in the public eyes. Alternative #3 could be seen as a proper step in the formation of a “new ministry” that will help in the accumulation of experience and expertise for the actual establishment of such a ministry. This alternative broadens the scope of work from “traditional” civil protection to civil security.

Basic Alternative 4 – Integration into the Ministry of Defense and **Basic Alternative 5** – Integration into the Ministry of the Interior.

These two alternatives envisage integration of the existing structures for population and infrastructure protection into the Ministry of Defense and of the Interior. Each of the two alternatives is in practice a step backwards from an organizational perspective. These alternatives are often based on practice adopted in several European countries. It is a fact, however, that the discussion on these issues goes on in a number of European countries (Sweden, Norway, Germany, etc.) and there is a tendency towards the separation of civil security as a “third pillar” of the security sector. The integration of the structures for population and infrastructure protection in some of the power administrations eliminates in practice the possible implementation of the civil security concept and the idea for initiative, contribution and self-organization of citizens for the protection of population and critical infrastructure. An “enlarged” scope of risks and capabilities in these alternatives means the enlargement of the present scope of civil protection in a direction of including new risks, capabilities, and activities within the competence of the corresponding ministry.

Basic Alternative 6 – Ministry of Civil Security

The establishment of a new Ministry of Civil Security to a large extent corresponds to the formation of an integrated security sector in Bulgaria and a separate “third pillar.” As a separate ministry, the Ministry of Civil Security is intended to bridge the gap between the system of national security (at a macro-level) and the system of population and infrastructure protection (at a micro-level). A new Ministry of Civil Security will enable the coverage of a larger scope of risks and will, apart from that, permit a more active civil participation through voluntary paramilitary formations, through the structures of civil society and business. An “enlarged” scope of risks and capabilities in this alternative means enlargement of the present scope of the State Agency for Civil Protection to cover new risks, capabilities, and activities.

The Ministry of Civil Security could be partially established based on the experience of the *Department of Homeland Security* (in the US) and the Ministry of Emergency Situations (in Russia and Ukraine), on one hand, and on the Bulgarian traditions, capabilities and realities, on the other. The Ministry of Civil Security is to include organizational units based on the following current state agencies:

- The State Agency for Civil Protection;
- The State Agency for Refugees;
- The State Reserve and Wartime Stocks State Agency;

- The newly established agencies, including “Civil Security Services” Agency – a new agency which is to coordinate and control the work of paramilitary voluntary formations (Civil Security services) set up with the regional governors.

The establishment of a Ministry of Civil Security raises the issue of the institutional place of several other agencies and services directly related to the provision of civil security – namely, the National Service “Fire and Emergency Safety,” which is currently a structure within the Ministry of the Interior. Since the National Service “Fire and Emergency Safety” is an important element of the citizen and infrastructure protection system, it is logical to include it in a possible Ministry of Civil Security in the future.

These six alternatives were described and analyzed within the context of the following factors and circumstances (divided in four groups), characterizing both the present and future target state of the system for protection of the population and the critical infrastructure:

- *Vision.* The establishment of the present system is compliant with the requirements of a totally different social and political system and threats and this necessitates adequate changes and optimization pursuant to new realities: market environment of social development; increasing significance of critical information infrastructure protection; implementation of the idea for initiative, contribution and self-organization of citizens for protection of the population and critical infrastructure; implementation of efficient monitoring and prevention.
- *Capacity.* It is necessary to maintain an integrated combination of capabilities, optimally distributed among different organizational structures. The main groups of system capabilities are: monitoring; early warning; preparation of the forces, population, infrastructure, system; readiness; rapid reaction; augmentation of response efforts; reconstruction; reduction of vulnerability⁶ and other types of prevention.⁷
- *Financial and economic state.* The maintenance of such capabilities should be compliant in volume and type with the resource capacities of the state and the principles of good governance in democratic societies.
- *Management.* Decentralization will enhance responsibilities and motivation of the individual local structures, while the central structure should provide for efficient coordination and active development of necessary capabilities. The central coordination structure should develop and apply consistently a number of functional strategies and programs for: capability development; human resources optimization; technological modernization of the necessary equipment; efficient financial management and investment attraction, including based on joint ownership and development of public-private partnership; development

of information-management and legal and normative framework of the system for population and critical infrastructure protection.

The expert analysis determines Basic Alternatives #2, #3, and #6 as fully compliant with the mission of the population and critical infrastructure protection system, with its scope and capacities, and with the resource provision which Bulgaria is able to guarantee.

Transformation also depends on the price of transition, which is seen as an additional criterion for selection of a final alternative or the formation of a transformation plan that includes the consistent implementation of a number of specific steps.

The results from the assessment and ranking of these alternatives are presented in Table 1. These results determine the selection of Basic Alternative #3—*broad interpretation of the Law on Crisis Management*—as the most suitable of the three basic alternatives for implementation in Bulgaria.

At this stage, the results of the analysis and the assessment show that:

- The optimization of the system for civil protection is related to more serious reforms and evolutionary improvement of the existing system with a focus on joint planning, preparation, common process for acquisition of capabilities;
- The fast transition to establishment of a Ministry of Civil Security raises suspicion of bureaucracy and shifts the focus from rescue teams and work at the local level to complicated procedures in the center.

Table 1: Summarized Expert Assessment of the Basic Alternatives.

Alternative			
	Optimization of the operational coordination	Interdepartmental coordination of capabilities development and operations (maximum interdepartmental coordination, prerequisite for integrated population and critical infrastructure protection)	Ministry of Civil Security
	Draft Law on Crisis Management (Alternative #2)	Broad interpretation of the Law on Crisis Management (Alternative #3)	Ministry (Alternative #6)
Summarized expert assessment with EXPERT CHOICE	0.192	0.420	0.387

- The expectations from the adoption and implementation of the Law on Crisis Management are great and the achieved results will be of key importance for choosing the next steps.
- The complexity of analysis and assessment of the three alternatives suggests that the implementation of the Law on Crisis Management will be a difficult process, which requires a further development of this research following a similar methodology.

The main conclusion is that the expert opinion is seriously in favor of an integration of the crisis response system based on a broad interpretation of the Law on Crisis Management, which is very close to the establishment of a Ministry of Civil Security.

Main Steps in the Transformation of the System for Protection of Population and Critical Infrastructure

The main steps in the transformation of the system for protection of population and critical infrastructure could be divided into two groups: (1) invariant steps (unrelated to the selected alternative); and (2) steps whose detailed definition and/or implementation depends on the choice of alternative.

The invariant steps are:

Steps for development of normative base

- *Concept* of the system for protection of population and critical infrastructure (civil security system);
- *Strategy* for building up this system;
- Normative base for the development of public-private partnership for the protection of population and critical infrastructure – at a central level, at a local level, in the establishment and maintenance of specialized capabilities and means;
- Normative base regulating the protection of critical infrastructure, as well as the protection of critical information infrastructure in particular.

Steps for the introduction of principles and practices for efficient inclusion of citizens in the provision of security through the formation of voluntary paramilitary formations – the US National Guard and the UK Territorial Army could be used as a model for the establishment of these formations of civil security (establishment of Civil Security services with the regional governors).

Steps for introduction of principles and practices for efficient management

- Development and maintenance of a unified architecture of the system for population and critical infrastructure protection;

- Development of “sector architectures:” of a system for risk prediction and assessment; for integration of fixed and field communications and information systems; for collection, processing and distribution of space (aerospace) information, etc;
- Introduction of procedures and system for program management of the resources for protection of population and critical infrastructure;
- Introduction of efficient financial management and investment attraction, including on the basis of joint ownership (public-private partnership);
- Creation, testing and introduction of mechanisms (procedures for action, interaction, authorities, registries and other information systems) for the protection of critical infrastructure, including critical information infrastructure;
- Introduction of methods, models and systems for decision support, including the adaptation of models developed by the NATO C3 Agency and EU and NATO member-states.

Steps for research support

- Development of a model structuring the necessary capabilities for population and critical infrastructure protection according to risks and tasks, on one hand, and providing organization (the latter depends on the selected alternative), on the other hand;
- Development of a model of critical infrastructure and targeted analysis;
- Assessment of infrastructure interdependencies;
- Identification of critical sites and subordinations;
- Analysis of vulnerability to accidental and premeditated acts;
- Assessment of alternative proposals for increase of infrastructure robustness, including an analysis according to the “price-benefits” criterion;
- Development of a model of critical *information* infrastructure, vulnerability assessment, correlations, and risk;
- Assessment of the capabilities and development of a concept for the use of UAVs within the system for population and critical infrastructure protection.

Steps for technological optimization

- Optimization of the National Centre for Crisis Management (specification of information systems, decision support systems, systems for communications support, etc.);
- Establishment of a Center for collection, processing, and distribution of space and aerospace information;

- Participation in the development of a national system for monitoring of the radiation, chemical, biological, and bacteriological situation;
- Introduction of packages of modules for field emergency management.

The institution in charge of the implementation of these steps is the Security Council to the Council of Ministers (PCPPNDAC) and the State Agency for Civil Protection.

Steps for staff education and training

- Development of coordinated programs for staff education, training and further development according to the types of capabilities, risks, participants in the system for population and critical infrastructure protection – depending on the organizational affiliation and the extent of maintained preparedness for action;
- Development and application of unified education and training requirements to the staff within the system for population and critical infrastructure protection;
- Development of qualification requirements taking into consideration the specifics of the types of capabilities, risks, and the role within the system for civil security;
- Development and implementation of joint training programs.

Public awareness steps

- Development of coordinated programs for raising the public awareness of the need for the undergoing transformation within the system for population and critical infrastructure protection.

Steps for development of international cooperation

- Development of legal and normative basis and procedures / mechanisms for coordination of actions with other countries in the region, the European Union, and NATO.
- Consolidation of the participation in international organizations and initiatives.

The list of steps for transformation depending on the selected basic alternative is also of considerable length. The list could be studied after definition of the preferred alternative by the Council of Ministers and the Parliament.

Conclusions

The development of the Civil Security System is one good example of the transformation effort. It is a process that requires specific methodology to be implemented and the key is the interdisciplinary character of the issue. Based on the experience of the CNSDR-BAS in many similar projects—from White Paper on Defense through transformation of the largest defense company TEREM to the White Paper on Civil

Security—an idea to form a Center of Excellence in Security Sector Transformation (CoE in SST) has been developed. The Center could consist of:

1. Communication and Information Infrastructure (CII);
2. Working Groups (WG);
3. Knowledge Infrastructure (KI);
4. Expert Network (EN).

CII includes central hub with servers and workstations connected to the Internet and distributed virtual network of workstations of the WG members. *WG* are in the following areas: WG1 – Security Policy and Strategies; WG2 – Integrated Security Sector Architecture and Change Management; WG3 – New Technologies in Security and Defense.

KI consists of theoretical models in security and security sector areas; computer (software) models; literature and selected publications; accomplished projects in CoE; produced papers. *KI* is managed by a set of matrices to establish cross reference between problems and methods to support their solution in order to easily form strategies (networks) of steps for decision making.

One of the key elements of the CoE is the *Expert Network* built around the participation in conferences, editorial boards, NATO SC panels, PFP Consortium, DCAF, CESS, and other international security-related organizations and programs. Of course, the EN is extension to the WG and KI. One of the key elements of the EN / KI is the capability to deliver knowledge through different courses, including in an ADL / CAX environment.

Development of such a type of support to decision making and to the implementation of security sector transformation is proved to be critical especially for problems of building architecture for network-based capabilities.

In this direction is the current NATO Science for Peace Project SFP-981149 for building new capabilities in Decision Making Support for the Bulgarian Security Sector “*Operations Research Support to Force and Operations Planning in the New Security Environment.*” The project aims to provide timely and effective scientific support, drawing on existing and developing novel operations research methods and models, in order to meet current and anticipated needs of end users from defense establishments, ministries of interior and civil protection agencies both in decision making process / change management and support of computer aided exercises. In addition, project results will be incorporated in the curricula of Bulgaria’s Defense and Staff College and the Academy of the Ministry of the Interior.

Through this project Bulgaria will establish a Centre of Excellence in Operations Research (OR), attracting promising young scientists, conducting cutting-edge research on force and security-sector transformation and network-enabled operations, and facilitating the integration within the NATO's OR community. The project networks the supplementary capabilities of several academic and research organizations from Bulgaria (the C4ISR Laboratory of the Institute for Parallel Processing and the Operations Research Department of the Institute of Mathematics and Informatics, both at the Bulgarian Academy of Sciences, supported by many other institutes as Institute for Parallel Processing, and the Defense and Force Management Department of the Rakovsky Defense and Staff College), from Germany (Niemeyer Operations Analyses), and The Netherlands (the Operations Research and Business Management Division at TNO Defense, Security and Safety).

Best way to achieve comprehensive understanding of the security and to plan transformation of the security institutions in an integrated security sector is through multidisciplinary joint / multinational studies. As in the theory and practice of computer networks, the architectural approach is proved as a best tool – such instrument is needed for change management in the area of security and security sector. The presented project is one practical implementation of this idea to be tested further in real environment by supporting the implementation of the just approved Crisis Management Law.

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Notes:

- ¹ We should add to these three pillars also foreign politics and diplomacy (particularly the protection of Bulgarian nationals and property abroad) conducted by the Ministry of Foreign Affairs.
- ² With regards to infrastructure, the function “monitoring” is implemented only in relation to the one defined as critical.
- ³ This definition of goal allows the application of methods for qualitative assessment and optimization.
- ⁴ Known as “public-private partnership.”
- ⁵ At this stage there is no such or similar organization in Bulgaria
- ⁶ In principle, one of the results of systematized efforts for risk management (mitigation).
- ⁷ As far as this is technically possible and expedient from a resource perspective.

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