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NATIONAL DEFENCE
AGAINST TERRORISM R&T
STRATEGY

CONCEPTUAL CHARACTERISTICS

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FOREWORD

In the analysis elaborated by the Center of Excellence on Anti-Terrorist Advanced systems (CATAS) entitled „**National Defence R&T Strategy – conceptual characteristics**” it was clearly and explicitly proved the lack of not only a written politics and strategy in the area of the research and development for the national security and defence, but also of any systematic, expedient and reasonable activities in that direction on behalf of the national governmental bodies and organizations. The negatives from this status influence not only on the defense capabilities of the state, but also on its stability and the development of its social-economic basis.

The necessity of politics and strategy in the area is undisputable. But how can it be satisfied and how to achieve the goals that we wish to realize?

One of the goals of the future politics is to answer **timely** in accordance with our priorities and allied and partner engagements what shall we do, how and when shall we do it and to identify the areas and the resources needed to support our efforts in the area of **counter-terrorism**.

It is no chance that the accent is set on the timely establishment the right basis of the process. When the concomitant issues shall be laid down and described in details? Whether after development and adoption of National strategy for development of research, Strategy for national security and Strategy for development of Bulgarian defence technological and industrial base? Whether within the frames of the Strategy for research and technologies for the national security and defence or the problems shall be worked out separately? The answer to all these questions is only one: we can work out a Strategy for research and technologies related to defence against terrorism only on module basis enabling us to develop the scientific and practically applied matter of extremely high priority, in parallel with all the rest of the problem areas connected with it. I.e., we shall use an adaptive approach which will allow the elaborated by us subject-matter to be “open” to everybody.

But is all this possible, are we able to create such „Perpetual Motion Machine”? Difficult question, however the answer, from the view point of its importance, is obvious, «yes», we have to do everything possible in order to say at last how Bulgaria will contribute to its own and that of the allies and partners security in the most crisis, currently and in many other moments, area ? Why? Because no one will secure us any «comfort» in connection with:

- **The key objects** of the critical infrastructure which may become object of terrorist threat. These are the numerous, present and future, objects of the power and transport sectors – the nuclear power plants, gas mains and oil pipelines, the harbor infrastructures, airports and many others, the hostile impact on which will result in innumerable losses not only at national but also on European level;
- **The time** – no one is certain, or has no enough information, if and when Bulgaria may become terrorist attack “destination”. As NATO and EU members we are not “insured” against such “attention”. The preparation and realization of such an act does not suggest many efforts while the preparation and counteraction against such threat require versatile, consistent and thorough actions.

In the long run the conclusion is only one – we must proceed immediately to the elaboration and adoption of **National Defence Against Terrorism R&T Strategy (the Strategy)**, if we do not want to be „surprised”. The conventional threats, which provide us the grounds to join the USA antimissile shield are an important factor, determinative for our national security and defense, but they are not the only and immediate generators of uncertainty. The invisible, unpredictable and unexpected attacks of the terrorist organizations, against the valuables of civilization, are the main problem of humanity today, including Bulgaria.

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INTRODUCTION

The theory on the issues of defence against terrorist threat is focused on two aspects, two kinds of strategies, related to strengthening and development of the counter-terrorist activities: **defence against the source of the threat (S-strategy) and defence of individuals and infrastructure (L-strategy)**. They can be assessed as follows:

First, the defence against the prime source is a function of the reconnaissance bodies, which are highly experienced in the counter-terrorism and command possibilities, not only in national, but also in international plan, to obtain the necessary information and to undertake due and adequate precaution measures. The main feature of their activities is the defence against the so called “uncertainty”. Uncertainty from the point of view of the need to identify three main parameters very clearly and precisely, and namely: where, when, and how the terrorist attack will be executed. The extent of that uncertainty influences significantly both the economic and psychological expenses and leads to painful changes in the routine conduct and way of life.

Second, the defence of individuals and infrastructure is a public product and thus it is responsibility of the governmental bodies of highest levels. As for the counter-terrorism, it should be a priority and responsibility of the Council of Ministers of R. of Bulgaria. The main feature here is the limited capabilities for adequate counter measure which takes place if the first step of counteraction (i.e. defence against the prime source) does not work. The level of the technologies involved providing for the defence and security of humans and infrastructure has a decisive significance for successful accomplishment of **L-strategy**.

The prevalent public consciousness apprehends the counter-terrorism and the development of technologies as immediately interconnected parts of one whole. Nevertheless however, the legal bodies and the military adapt the available “civilian” technologies for their purposes as a result of a number of restrictions (aggressive and dynamic terrorist threat, insufficient time for preparation and counteraction, insufficient finance and other resources).

Shall we develop new technologies for successful counteraction of the potential terrorist threat? Is it necessary to allocate additional finance, material and human resources in order to state with enough certainty that we are prepared for counteraction against any challenges of that kind?

We wouldn't be able to answer those questions unless we are clear about which are our priorities for the national security and defence. Nevertheless the significant issues for us can be numerous and decisive for our future but the successful defence against the terrorist threats is undoubtedly one of our paramount goals and tasks. In order to be able to approach to decision of the number of complicated in their nature and content issues in that direction however, in the first place we shall clarify the following:

- In which directions of fundamental and applied research our country has proved capabilities and expressed advantages;
- Which scientific directions we wish and have to develop on our own, considering the number of factors, i.e. capabilities, necessity, expediency, multiplication of results and which can be justifiably and imperatively realized in collaboration with our partners;
- Which are the technologies that we shall seek to develop with the clear consciousness that, on one hand, they should be unique to a significant extent (i.e. to not copy the available ones in the “military” or “civilian” spheres), and, on the other hand, to ensure possibilities to generate new capabilities in a number of areas different from the defence against terrorism, which in addition lead to useful economical results;
- What is and what shall be our contribution to the collective defence of the NATO and EU member countries in the area from the point of view of our membership and responsibilities taken;

- What will be our politics at regional, European and international level, considering our participation in a number of international organizations aimed to protection and consolidation the peace on earth, etc.

Those and many other questions can be answered only after: making a through analysis of the current status and prospects for development of the issue in this country and the member countries of NATO and EU; determining the main goals of the governmental politics in the area; describing the rights and responsibilities of the bodies and organizations involved; laying out the requirements to the counter terrorist scientific research and technologies developed and defining the financial frames; outlining the prospects for development of research and technologies and to describe the measures which should be taken to initiate the strategy, etc.

1. POLITICS OF EU IN COUNTER-TERRORISM AREA

After the terrorist attacks in the U.S.A. from September 11th, 2001 and especially after the bomb assault in Madrid on March 11th, 2004 and in London on July 7th, 2005, a number of countermeasures were taken to create conditions so that such tragedies do not happen more.

Many bodies in EU undertook numerous activities to prevent the terrorist attacks of any kind in all areas of the public and economic life in EU member countries.

In result of the joined efforts, on November 30th, 2005 the Council of Europe adopted a document, uniting the requirements of all participants, and namely „**The European Union Counter-Terrorism Strategy**” („**Strategy**”). However the realization of the joined counter terrorist activities of EU member countries was initiated in June 2004 when the European Committee adopted „**The Action Plan to Combat Terrorism**”.

1.1. The Action Plan to Combat Terrorism

In March 2004 the Council of Europe adopted the Declaration for defence against terrorism where the priorities in the area are outlined. In June the Council adopted the Action Plan to Combat Terrorism.

Based of activities laid in the Plan, the security of airports and aircrafts is increased in short time.

In year 2005 two key directives supporting the Plan are adopted: the third “Money Laundering Directive” and „**Directive on Enhancing Port Security**”. The European Agency for the frontiers **FRONTEX** begins functioning the same year. Together with EUROPOL and EUROJUST (European Union Judicial Cooperation Unit), FRONTEX establishes a net of executive bodies for increasing the security of the outer borders of EU.

As a logical consequence of these efforts, „**The European Union Counter-Terrorism Strategy**” is proposed for adoption on the meeting of the ministers of justice and domestic affairs in Newcastle in year 2005.

1.2. European Union Counter-Terrorism Strategy

The European Strategy lays four major directions (“pillars”) for activities in the base of defence against terrorism: **prevention, defence, persecution and response to the threats**. It demands that the bodies on all levels, national, European and international, did everything possible to decrease the terrorist threat and to increase our defence capability and possibility to face adequately the challenge of the “plague” of 21st century. The Strategy poses a number of goals to prevent new members to join the terrorist organizations, for a better defence of potential targets for terrorist attacks, for persecution and investigation the members of the existing terrorist nets and improvement of our capability for response and management of the consequences from terrorist attacks.

Based on the four “pillars” in EU identified, in implementation of its own „**European Security Strategy**”, the EU announces its engagement to take responsibility in supporting the global security.

With the Strategy the EU seeks to contribute for:

- strengthening of national capabilities;
- facilitating of European cooperation;
- Collective capabilities development;
- Encouraging of international cooperation.

The defence of European borders is the key issue in the Strategy. While the main task and responsibility of the member countries is to improve the protection of critical potential targets for terrorist attacks, the mutual dependence of security of borders, transport and transborder infrastructure require the joined efforts of EU. It is accepted with absolute majority that the efforts shall be aimed to the outer borders of EU in order to prevent a possible penetration and activities of terrorists on its territory. This is the reason why the Strategy and its implementation are especially important for Bulgaria considering the two borders, south east, which are outer borders for EU too.

For practical application of the activities envisaged, EU created European Agency for the frontiers **FRONTEX** and builds Visa Information System and the second generation of Schengen Information System. The Agency is purposed to assessment of the risk, a part of the efforts being aimed to increase the oversight and surveillance of the outer borders and the two information systems enable to exchange information in real time for candidates to enter into the Eurozone and to deny such access if needed.

Considering the necessity for new technologies ensuring increased security of airports, bus and railway stations, harbors, main roads and infrastructure, the Strategy requires more adequate using the research and development programs of European Commission. It also determines the key priorities which should be followed in order to achieve a reliable defence of the potential targets for terrorist attacks:

- Increasing the reliability of EU citizens passports by including biometric data for their holders;
- Building Visa Information System and the second generation of Shengen Information System;
- Development of effective risk analysis for the outer borders of EU through FRONTEX;
- Applying the commonly accepted standards for security of aircrafts, airports, harbors and vessels;
- Accepting the European program for protection of critical infrastructure;
- Establishing the best level of the investigation in EU in the area.

1.3 European Defence R&T Strategy

The approval of European Defence Research&Technology Strategy by the ministers of defence of EU member countries in September 2008 was a necessity caused by the logic followed by the **European politics in the area of defence and security**.

On the other hand, the Strategy enabled the European Defence Agency (EDA) to accomplish in the best manner its obligations in the following areas:

- a) Development of defence capabilities for crisis management;
- b) Enhancing and broadening the European armaments cooperation;

- c) Strengthening of the defence and technological industrial base; and
- d) Enhancing the effectiveness of the European defence research and technologies.

The necessity of joined strategy in the area is even more imperative considering the following tendencies:

- Increased political aspiration and desire for investments in research and technologies aimed to response to the present and potential challenges in the areas of defence and security. For example, the decision of the Steering Agency Board from year 2007 for allocation of no less than 2% fro the defence budget of each member country for research and technologies;
- Introduction of European level for the capabilities management approach during programming the research and technologies. By means of the Strategy the bond between requirements to the capabilities and the initiatives in the area of research and technologies can be strengthened;
- Changes in the supply chain of defence production. Recently the European defence industry has been significantly re-structured. The corporate trans-border property leads to complications on the industrial stage where SME still search for their place in the supply chain;
- Multinational cooperation. First and foremost, availability of different in nature and spirit procedures, cultures and languages in this sphere.

The development of European Defence R&T Strategy is in unison with the Capability Development Plan and the European Defence Technological Industrial Base Strategy, accepted by EDA on May 14th, 2007. The synergy among those three documents, together with the European Armament Strategy enables reaching the main goal to improve the European defence capabilities. The harmonizing of military requirements and thus the enhanced cooperation among the member countries are the main roads to satisfying the European defence necessities and ensuring the so much desired autonomy of Europe in the areas that are crucial for its security.

The Strategy invented the necessary conditions to determine and systematize the key technological areas and **the research capacities** for scientific support for building the capabilities. The core of the Strategy is the list of 22 priorities in Defence R&T area which serve the defence necessities of the member countries.

The main advantage of the Strategy is that it presents the priorities in research and technologies in relation with the priorities of Capability Development Plan, thus closely binding them with achievement of the planned defence capabilities.

On the other hand, the Strategy poses the research and technologies issue as a corner-stone and a binding link between the **defence capabilities** and **adequate defence technological industrial base**, which is the key issue in the process of satisfying the defence capabilities. This is the marking post whose level and development indicates the extent for satisfied capabilities.

In conclusion, it is necessary to mention that:

1. There is an orderly system developed within the frames of EU for implementation of the European Security and Defence Policy in the part for counter-terrorism with a clearly outlined hierarchy and mutual interconnections between the separate elements.
2. There are **written sector politics** for each element of the system which regulate the implementation of different activities for achievement of the anticipated results.
3. **The core** of the system is the determination of:
 - the necessary defence capabilities of EU;
 - the necessary research capacities providing for the scientific support of the defence needs for building the capabilities;

- the necessary defence technological and industrial base providing for the technology level of the needs creating superiority on capabilities.

4. In the same time, however, the problems connected with counter-terrorism research and technologies are not characterized with clear requirements upon the priority scientific directions; the accents for each direction are not fixed; and the capability matrix which we wish to achieve is not bounded with time. In other words, it is not clear how, in which way the research and technologies will contribute to combat the source of threat (**S-strategy**) and the defence of the separate individuals and infrastructure (**L-strategy**). That is not made also in the Study on the innovative and competitive potential of the defence related supplier base in the EU12, implemented by EDA, independently of the discussed problems were to the defence industry (the discussed R&T are a part of them).

Within the context of international combat-terrorism, the defence policies of EU has been developed very dynamically since year 2004. In November 2005 the European Committee accepted the Green book for European Programme for Critical Infrastructure Protection (EPCIP). On that base in year 2006 EU initiated the EPCIP and Critical Infrastructure Warning Information System (CIWIN) is in process of development. The Directive of the Council from December 2006 concerning identification and providing for the European Critical Infrastructure and assessment of the need to improve its protection is endorsed.

All of this is an effort huge in substance and volume but the close interconnection between the documents discussed (EU Counter-Terrorism Strategy, European Defence Research&Technology Strategy and the regulations for protection of critical infrastructure) is not realized, which does not contribute to achieve the best results in building adequate capabilities for countering the terrorist threats.

2. ANALYSIS OF THE PROBLEMS IN OUR COUNTRY.

One of the main directions of counter-terrorism is the Polices in the area of defence&security related research and technologies. The formation of an expedient, **unified**, practical & applied and financially provided polices in this area is a guarantee for success and prevention against any losses, which for its part is a precondition for realization of continuous and consistent social and economical development of this country.

Unfortunately however, there is no written politics and strategy for its implementation as well as practical work to improve that state of affairs. Practically, there are different aspects of R&D activities, which are realized in favor of the national defence and security by bodies having constitutional duties in this area. However, a politics for research and technologies, and moreover a unified and focused on counter-terrorism one, does not exist. In many cases a lot of the subject-matters of the different bodies and organizations overlap and in many other there is a huge thematic gap in the counter-terrorism area. An example proving this ascertainment is the fact, that none normative document in this country contains described requirements to counter-terrorism R&T or Bulgaria is a party in international agreement. We participate only and solely in agreements aimed to develop and apply countermeasures against the source of threat but not for protection of humans and infrastructure by use of the advanced Science and Technology (Appendix 1).

First of all we shall answer the question if it is advisable to separate the counter-terrorism research and technologies from the rest directions of research activities in interest of the national defence and security. The “pros” and “cons” about their separation are numerous. But it is easy to prove using the generally accessible information in the foreign press that there are impressive results when the R&T expenses are clearly stipulated and the priority directions are determined.

What is the situation in our country? As an example we can indicate the Law of the state budget for year 2008 (Years 2009 and 2010 cannot be assessed because there is not data available.) The financing allocated to MoD is as follows:

Structure of the financing	Thousands BGN
Expenses for current maintenance	865 686.00
Investment expenses for new armament and equipment, overhaul and modernization of the available armament and equipment, etc. vested interests in defence area	251 479.00
Expenses for defence R&T	2 230.00

Thus, the funds allocated for defense R&T consist a part of **0.19 %** of the state budget with a tendency is to decrease with the years. As far as for **expenses for counter-terrorism R&T, their size is equal to 0**. Consequently the state bodies and organizations are forced to satisfy almost 100 % of their needs for counter-terrorism technologies and equipment by means of purchasing from abroad. That practically restricts the possibilities for autonomous national efforts to guarantee security and protection of population and critical infrastructure. On the other hand, there are set preconditions for insufficient reliability, mistimed maintenance, etc. in the defence and security systems thus built, which makes them inadequate to the potential threats in some cases.

Why does the issue for counter-terrorism R&T stands on agenda now with even greater importance? Because R. of Bulgaria is becoming a key factor for building and maintenance of strategic energetic and transport objects in regional, national and international aspect on the background of dynamically developing environment and the attempt of the legislation to regulate the parameters for its functioning. Increasing their quantity, diversifying their types and enhancing the territorial areas where they are located, combined with the increasing risk of terrorist attacks imposes undertaking synchronized protection measures not only concerning using systems for surveillance and early warning, but means for adequate counteraction too. In other words, there is a necessity to elaborate a National System for Defence and Security of key infrastructure objects of not only national, but of regional and European importance (NPPs, gas- and oil pipelines, etc.)

3. MAIN GOALS AND STAGES FOR IMPLEMENTATION OF THE STRATEGY.

Considering the two mutually complementary strategies for countering to potential terrorist threats, i.e. S-strategy and L-strategy, it is advisable to initiate determination the goals of the politics in the area discussed. The investigations on the sources of threat (based on the system analyses on the nature of the threat) and thus determination of the most appropriate means and mechanisms for counteraction are among the basic priorities of the leading countries in the world. Their accumulated experience, knowledge and abilities and the results achieved enable prompt improvement the entire palette of tools which guarantee successful counter-terrorism. The bodies and organizations involved in this activity have the possibility to use the best practices for counter-terrorism based on the good relationship with the similar organizations within member countries of EU and NATO.

Concerning the protection of the separate individuals and critical infrastructure, each member country can make an immense contribution regardless of the natural restrictions of any kind (history encumbrance, territorial size and number of population, situation, traditions, etc.) The L-strategy can be applied successfully not only through significant financial means but also through proper concentration of the efforts in chosen priority scientific directions, development of

advanced technologies based on the best achievements in few key areas, which results in technologic break-through of significance decisive for achievement the final goals.

On that exact base the main goals of the national politics for counter-terrorism R&T are defined:

- providing conditions and appropriate environment for high-quality scientific investigations and developments with pronounced priorities on national, European and international level;
- providing conditions for accelerated, adequate and sustainable development and consolidation of the national capabilities through development and introduction of promising technologies for implementation of the tasks related to counter-terrorism and contributing for enhancement the capabilities of EU and NATO in the area;
- purposeful and systematic progress of the cooperation with EU and NATO research bodies and organizations involved in counter-terrorism R&T.

The main goals of the polices shall be achieved through: clear identification and precise timing of the national counter-terrorism R&T priorities; specifying the rights and responsibilities of the bodies and organizations involved in the area; providing needed conditions that the research organizations functioning in counter-terrorism R&T area participate actively in the work of the bodies and organizations of EU, NATO and their member countries.

The goals shall be achieved in two stages:

- During the first stage (before year 2015) the investigations are carried out and the identified promising counter-terrorism technologies are developed; Bulgarian Science nad Research organizations find their place in the entire architecture of EU researches and actively participate in European projects in the area;
- During the second stage (after year 2015) an accelerated transfer of technologies for building and/or improvement of particular modules of the national counter-terrorism system are carried out and the contribution of Bulgaria to the European counter-terrorism capabilities is increased.

4. INSTITUTIONAL SUPPORT ON BEHALF OF THE GOVERNMENTAL BODIES.

As it was mentioned, a unified Defence R&T System in Bulgaria, and in particular a counter-terrorism related one, does not exist currently. This ascertainment suggests the absence of whatever rights and responsibilities of any governmental body in the area. Or in case such exist already, they are only “on paper” and do not have any practical value.

In the project for “Strategy for Development of Bulgarian Defence Industrial and Technological Base” submitted by CATAS and accepted by the Inter departmental council on the issues of military industrial complex and the mobilization readiness of the country it is envisaged to establish a **National Defence Industry Council (NDIC)** uniting the efforts of the government not only regarding the defence industry, but also regarding the R&D activities providing for its development. Besides the other obligations, NDIC shall be entrusted with functions for:

- duly formulation of requirements, elaboration of politics and good quality implementation in counter-terrorism R&T area;
- providing for the unanimous and adequate participation of the governmental bodies and the research organizations involved in the activities of the analogical EU and NATO bodies and in bilateral relationships in which intergovernmental relationships in the area are coordinated;

- coordination of the interactions among all bodies and organizations involved during the annual allocation of the budget for research aimed to joined financing of mutually beneficial scientific projects and avoiding the overlapping of the efforts in counter-terrorism R&T area;
- providing for preconditions for strategic aimed research and development of technologies for counter-terrorism in dynamically changing environment;
- development and exercising different ways for cooperation among the research organizations involved on the issues counter-terrorism R&T both on national and international level;
- providing for conditions to save the existing and to develop new key capabilities of our own science, meeting the needs of the national defence and security and contributing for consolidated defence and security in accordance with the engagements of Bulgaria as a member country of EU and NATO.

The principles, on which the relationships between the government and the research bodies and organizations involved shall be realized, include, without being restricted to:

- **Competence and trust** – each party acknowledges the competence of the other;
- **Constructivity** – dynamical interaction and tangible feasible results of mutual benefit;
- **Coordination** – joined discussing and taking decisions on all issues related to counter-terrorism R&T;
- **Continuous communication** – mutual notifying about all events and facts of mutual interest; involvement of the research bodies and organizations on the initial stage of formulating the requirements to counter-terrorism R&T;
- **Pursuit of cooperation** – the governmental bodies on all levels both in the country and abroad work for establishing mutually beneficial cooperation among the leading foreign research bodies and organizations with analogical Bulgarian representatives involved in counter-terrorism R&T.

The adequate, successful and durable results, beneficial not only for Bulgaria, but also for our partners and allies within EU and NATO, can be achieved only on the base of the aforesaid frame of responsibilities and principles of relationship.

The establishment of such relationships is of paramount importance for our successful participation in the European bodies and organizations involved in the problems, and first of all with EDA and with those of NATO, RTB and RTO. But how has to be organized our participation at these organizations (at the moment there is not an approach like this). Because we don't participate at no one program or EDA project (Force protection or JIP-ICET). IMS participation at NATO Defence Against Terrorism Program doesn't mark that we has a government policy at the discussed area. What are we doing about Framework Program-7 (FP-7) of the European Commission, part "Security" or the Program of European Commission: "Freedom, Security and Justice", sub area "Prevention, preparedness and Consequence Management of Terrorism and other Security related risks"? At the NATO Science Committee there is our representative but there is not idea what have to be done as a systematic approach to take part in these NATO projects.

5. R&T REQUIREMENTS AND FINANCIAL ASSURANCE

5.1 General conditions

Our country doesn't have to implement R&T alone to sustain all identified capabilities we have to acquire to defence against terrorist threats. In that connection, the key technological areas for

creating of these capabilities have to be identified and systematized and the needed scientific capacities have to be created. It is available a need of place and role identification of the technologies to reach of the planned goals at the area and how many of them will keep their potential at the frame no less 10-15 years. We have to identified and prepare the frame and content of the themes of research and developments and a List of basic technologies supporting the state policies at the discussed area. It will guarantee timely and effectively government policy implementation at this direction. This process has to be realized by goals prioritization, respectively the areas with key technologies under authority of NDIC.

To the building and development of counter-terrorism R&T MoD and Ministry of interior have to take part in, as well as the subordinated scientists organizations, national scientists organizations and business as a direct consumer of these achievements.

The goals formulation of the counter-terrorism R&T Strategy goals (emphasized on the individual and critical infrastructure protection) have to render an account all of that.

What the basic tasks at this direction have to be?

On a first place conditions for **national common operational picture of critical infrastructure** has to be done.

On a second place, new security and protection systems, on new generation, where are integrated not only possibilities for detection, identification, timely reaction and successfully counteraction but a flexibility, self diagnostic capability and self recovering will be available.

Why these tasks have to be at the base of counter-terrorism R&T. Because at the base of the R&D activities is imperative integrated the capability to generate and realize qualitative new opportunities.

5.2 Main efforts.

All this diversity requires consistent and systematic approach by all bodies and organizations, engaged with the issues of anti terrorism. No one of the state structures is capable to coop with the accompanying problems. Therefore, it is necessary to combine the efforts not only of the security and jurisdiction bodies but also and first of all of our native science. Because, as noted above, if we do not provide conditions for development of our capabilities to counteract against the newly arising and more and more complex terrorist threats sooner or later we will not be able to reply adequately.

The efforts in this direction could be configured in various ways but one of the scientific fields which we are developing and have to improve at accelerated rates is the progress of sensors and sensor systems.

The science of physical detection and tracing covers both observation in many forms and interpretation of the observation data. The current accent on the detection of the physical inrush includes improved automated observation of the respective object, maintaining optimum capabilities for detection of trespassers in different climatic and terrain conditions, for faster and more accurate identification and interpretation of the intrusion signals (compared to false or accidental signals) and sending the results to improved tools for intention analysis with the purpose of threat categorization and vulnerability registration. The wireless technologies have more and more decisive importance for the technological systems in the automation, communications and informatics that are widely spread in the critical infrastructure sectors. However, on the other hand the wireless networks are highly vulnerable as a consequence of security limitation as a result of (but not only) risk increase of the activity of mobile wireless units, which can enter, cross and go out of the net thus creating situation of deep disturbance of the wireless network functionality or interruption of its operation.

There is a necessity of elaborating sensor systems which can observe and report the infrastructure condition, measure and report the damages, assess the reduced function and calculate the time of

stay due to repair of the respective object or installation. The intelligent/advanced sensor systems can be programmed to suggest repair alternatives which will require integration and communication with the modern support systems for analysis and solution.

The intelligent systems will have numerous types of sensors, communication capabilities, so that they are able to “talk” with each other and capability to perform calculations so that they can make analyses, compare the received sensor information and analyses and “self-train” on the basis of the analyses and experience. In order to be widely distributed such intelligent sensors should be cheap, durable, precise, self-calibrating and capable to adapt to the environment. The sensors and sensor systems will have to be “trained” to seize the threat, self-configured and self-restored. They could be wire or wireless or a combination of the two types, but they should be information secure.

It is necessary the sensors to possess capabilities which to satisfy the need not only of providing security and protection against terrorist attacks but also to react in case of fire, to register the first indications of earth quake, to be able to function in conditions of disturbed power supply or extreme climatic conditions.

On this basis, with the purpose to increase the effective protection of the critical infrastructure objects (CIO), the Institute of Metal Science/Center of Excellence “Anti terrorist advanced systems” developed modern intelligent detection and sensor systems. They identify and characterize quickly and accurately the threats of physical inrush against CIO. The sensors are also used for observation and as source of information about the condition of the different objects (such as for example power stations and industrial complexes). The huge quantity of information is processed and analyzed by the detection sensor systems for selective filtration of the background signals with the purpose to create a clear picture of the protected object. The data and analysis results are sent to other sensor systems and further analyzed for feeding operative information to the operators of the system for making decisions of counteraction against terrorist acts.

The next step in the activity of this line should be development of sensor systems which can self-organize and self-restore as well as adapt to the environment specific conditions in which they operate. On the other hand, the detection systems should possess capability of switching over between different physical approaches of sensing magnetic, seismic, acoustic, radioactive or gravitation variations from satellite, air, robotized or ground platforms (on land, underground, on water or underwater).

5.3 Structure and content of R&T for defense against terrorism.

On the base of that „general line” of our efforts it is necessary to configure the structure and content of R&T for defense against terrorism. The cross-sections may be numerous but the following realities should be taken into account:

a) the Capability Development Plan of the European Defence Agency. It has to be “the driver” for the R&T community in Bulgaria. But from the view point of the specificity of the considered scientific problems we have to concentrate very carefully our efforts only in these capabilities identified by CDP, which could and should be related to the anti terrorist protection. They could be:

- Computer Network Operations;
- Mine Counter-Measures in littoral sea areas;
- Intelligence, Surveillance, Target Acquisition and Reconnaissance Architecture;
- CBRN Defence;
- Counter-Improvised Explosive Devices;
- Increased availability helicopters;
- Network Enabled Capability.

But have we to develop and support technologies for all these capabilities? We have indisputable achievements at international level in the fields "Mine Counter-Measures in littoral sea areas" and „Counter-Improvised Explosive Devices". Isn't it expedient to extend our possibilities in these lines, in part of them to work in cooperation with our partners and for the remaining part to use the achievements of the allies.

b) 22R&T priorities of European Defence Research&Technology Strategy. We could successfully develop (from the view point of their application in the anti terrorist protection):

- Command and control technologies, especially at area of innovative Sensors for Urban Warfare, including acoustic and seismic sensors;
- Networked sensor control, management and cueing;
- EO Systems & Integration;
- Technologies for secure and robust information management, information exchange and communications;
- RF generic technologies (only at the integration area);
- Physical protection;
- Environment definition (oceanographic & hydrographic techniques and analysis);
- Underwater systems.

c) Probable national approach.

Technology is, of course, not the only answer to addressing the specter of transnational terrorism, but the technological answers we have today are inadequate to deal with the scope and potential severity of the threat. Rather than adapting technologies to stay apace of evolving dangers and changing tactics, we need to get ahead of the terrorists and develop "overmatching" security systems that protect the public, safeguard their liberties, and leave travel and commerce unencumbered.

Developing technologies that leap ahead of the terrorists requires vision and strategy, and a good strategy requires hard choices. It begins by establishing criteria for selecting the most crucial technological investments. There should be three:

- **Seeking** out technologies that can contribute to building a true national system that addresses all the challenges of terrorism from intelligence and early warning to domestic counterterrorism and response. It is unlikely that our and any country will have the resources it needs to address every security shortfall or law enforcement need. Thus, the first priority of a sound strategy should be to invest in technologies that best leverage all the existing capabilities that are available by integrating them into a cohesive system;

- **Adopting** technologies that get the "biggest bang for the buck." Spending a little research, development, and procurement resources on many things may not buy much of anything. Husbanding and targeting investments on the technologies that can provide the most security for the resources invested, ones that are the most flexible, ones that contribute to addressing a wide range of threats from kidnapping to catastrophic, is a better approach for stealing a march on the terrorists;

- **Reaching** for "breakthrough" technologies. Terrorist groups have limited resources and limited means; thus, they are quick to refine their methods, improving on time-tested techniques, or improvise, seeking out new ways to strike or new targets to attack. In response, law enforcement officials update their investigatory techniques or implement new security measures. Breaking the cycle of innovation and countermeasures between terrorism and counterterrorism calls for unprecedented innovation with which terrorists can simply not compete.

On the base of above mentioned criteria these technologies can be:

- system integration technologies;
- technologies against CBRN threat;

- non-lethal weapons;
- data mining and link analysis technologies;
- nanotechnology and new materials.

Our experience and knowledge will help us to develop advanced and adequate security and protection system to people and critical infrastructure.

On the base of the above said, the structure and content of R&T for anti terrorist protection could be, but not limited to, of the following functional areas:

- Detection and sensor systems;
- Analysis and decision making systems;
- Prevention and protection systems;
- Threat counteraction, restoring and reconstructing systems;
- New threats and weak points of the objects;
- Promising infrastructure architectures and system design;
- Humanitarian and social issues;
- Others.

The prioritization of the purposes for each area imposes the necessity of applying modern approaches for the capabilities management in the programming of the researches and technologies. This approach suggests the necessity of identifying the priorities in the researches and technologies as a resultant of the priorities established by national capability development plan, Capability Development Plan of EU, respectively. The following should be also taken into account:

- The impact of the technological inventions and progress on the capabilities;
- The development of the Bulgarian defense technology industrial base;
- The possibilities for cooperation, etc.

It is necessary MoD and Ministry of Interior to provide the required conditions for maintaining consistent policy of close cooperation with the research teams and industry and facilitation of the timely and successful transformation of the developed technologies in high tech products. The main tool of this policy is establishment and support of Centers of excellence on the base of recognized research centers elaborating and manufacturing products for the national security and country defense.

From other point of view, the subject-matter of each sub-section is also an object of discussion and priority identification. But in the long run, the joint work of the integrated teams of specialists has to give answer to the following two questions: first, in which areas we could and should improve the available and develop new technologies; and second, in which areas we shall use the already available at the international market technological solutions. The stagger/departure in any area/direction is not a wise solution. Because the creation in our country of capability for building modern high tech and developing autonomous security and protection systems should be our main priority. The adoption of such approach will mean that we have nationally responsible policy in the field of anti terrorism.

5.4 R&T financing.

It is basic issue. How should the financing of this activity be organized (as currently there is no such financing at all)? To authorize the MoD or Ministry of Interior, to be concentrated in only one of them or the financial support to be “taken out” of these departments and a third body to be assigned, for instance NDIC, to be in charge of the financing. There are many „positive” and many „negative” for one or other approach. But that a mechanism which shall resolve this problem has to be introduced is a fact that should not be discussed. But if we wish fast and good

results, the finances for this activity have to be managed by one body which should be responsible also for the results.

On the other hand, we should not forget that according to the engagements undertaken by Bulgaria under the Lisbon strategy, our country should provide 3% of GDP. EDA Steering Board accepted in 2007 the member countries to assign 2% of the defense budget for Defence R&T, 20% of them being for joint projects, in the frames of EDA. In the end, what will be the share of R&T for anti terrorism bearing in mind these facts? The question is controversial and will be resolved after the reply to the questions above said in this document.

CONCLUSION

As already noted, in the elaborated by CATAS “National Defence R&T Strategy – conceptual characteristics” it is necessary to unite around the formation of mechanism which shall guarantee timely and accurate development, adoption and execution of the so discussed in this document Strategy. The sooner this happens the more in time we shall have adequate and reliable security and protection systems for the people and critical infrastructure. We have lost enough time while the dynamically changing environment and terrorist threats could surprise us at any moment.

List of international legal tools for pursuit and punishment of various forms of terrorism under which Republic of Bulgaria is currently a party:

- International convention against terrorism financing;
- International convention against bomb terrorism;
- Convention of nuclear material physical protection;
- International convention against hostage seizure
- Convention against illegal aircraft seizure;
- Convention of plastic explosive marking to be detected;
- Convention for prevention and punishment of crimes against internationally protected persons, including diplomatic agents;
- Convention for pursuit of illegal acts against the civil aircraft security;
- Protocol against violence illegal acts in airports for the international civil aircraft complementing the regulations of Convention against illegal acts against the civil aircraft security adopted in Montreal on 23.09.1971;
- European convention against terrorism signed on 11 September 1997 in Strasburg;
- Convention for pursuit of illegal acts against sea navigation security and Protocol for pursuit of illegal acts against the security of static platforms on the continental shelf;
- Convention for crimes and some other acts performed on the board of aviation vehicles signed in Tokyo on 14.09.1963;
- Convention concerning the safety of UNO personnel and the associated personnel, 09.12.1994.;
- UNO convention against the transnational organized criminality.

List of normative acts from the Republic of Bulgaria internal legislation related to antiterrorism:

- National security conception• approved by National Assembly resolution (published State Newspaper, No.46/1998).
- Criminal Code;
- Criminal procedure code;
- Law for special reconnaissance means;
- Law of explosives, fire arms and ammunitions control;
- Law for control of foreign trading of arms, and goods and technologies of possible double use;
- Law for chemical arm prohibition and control of toxic chemical substances and their precursors;
- Law for the Ministry of Interior;
- Law for the Bulgarian identification documents;
- Regulations for application of the Law for the Ministry of Interior;
- Regulation No 17 of 14.12.1999 for the conditions and order of achieving civil aviation security;
- Decree №39 of 27.03.2000 of the Council of Ministers for execution of Resolution 1267 (1999) of UNO Security Council, “freeze” of the financial resources possessed or controlled by “Taliban” group;
- Special decree №277 of the Council of Ministers of 12.12.2001 concerning the envisaged in Resolution 1373 (2001) measures against the global terrorism.