



**INSTITUTE OF METAL SCIENCE
CENTER OF EXCELLENCE
„ANTI TERRORIST ADVANCED SYSTEMS”**

1574, SOFIA, 67 SHIPHENSKI PROHOD BLVD., TEL.: + 359 2 46 26 200, FAX: + 359 2 46 26 300,
<http://www.homeland-security-center.bg/bg/>; stvims@ims.bas.bg

**NATIONAL
DEFENSE R&T STRATEGY
CONCEPTUAL CHARACTERISTICS**

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**Corresponding Member of BAS
STEFAN VODENICHAROV**

FOREWORD

During the past twenty years much was done in direction of the advance of the research and development activity (R&D) to the interest of the country defense and security. However, unfortunately Defence R&D Policy was not formed and Strategy for its fulfillment not made.

This affects extremely negatively the development not only of the country Armed Forces but also of the native science and industry engaged with the issues of the defense and security. The lack of clarity for the national priorities creates limitations not only in the frames of the country but also impedes the integration of our research and development teams in the international scientific society and at the same time decreases the competitiveness of the producers of defense products in Bulgaria.

Taking into account these facts, in the beginning of 2009 the Institute of Metal Science - IMS (the Center for excellence „Anti Terrorist Advanced Systems” - CATAS), in the frames of the Bulgarian Defense Industry Association, worked out a project of **Strategy for Development of the Bulgarian Defense Technological Industrial Base**, in complete correspondence with the requirements of the European Strategy for defense-technological industrial base and the European Defence R&T Strategy as well as the related to them documents. On that basis on **14 May 2009, the Interdepartmental Council on the issues of the military-industrial establishment and the country mobilization readiness at the Council of Ministers** reviewed the project of the Strategy and made resolution, under the leadership of the Ministry of Economics and Energetics, a Strategy for the Defense Industry Development to be elaborated and submitted for approval.

The project comprises the bases of the Bulgarian Defence R&T Strategy that should be further developed in a separate document reflecting all aspects of the newest achievements in this field. This imposes creation of a harmonious organization of all interested which to lead in short terms to elaboration and adoption of a modern strategy for defense researches and technologies in favor of the armed forces, country economy and the society as a whole.

We hope that the adequate institutions will consider with responsibility and attention this suggestion of ours, so that in the most recent time Bulgaria also to be able to express understanding for the importance and benefits of building an adequate to the realities and the future challenges scientific potential, in the security and defense, and the functioning of strong and modern defense industry.

**DIRECTOR OF IMS AND ATAS
STEFAN VODENICHAROV, D.Sc.,
Corr.memmber of BAS**

INTRODUCTION

There are numerous documents containing in them different aspects of the analysis of the past, present and the future of the research activity to the interest of the defense and security of the country. Unfortunately, most of the good intentions remained on paper and did not “see the light of the day”.

Certainly, this does not mean that the attempts to place our efforts in this field on a new basis consistent with the newest trends and requirements should stop. On the contrary, there is no more opportune moment than this in which we are to undertake active steps in direction of creating adequate to the current conditions realities and conditions for development of R&D.

First of all, we are NATO members already for six years and for three years “stay” in the European Union. For this period of time (from 1 January 2004 г.) many things happened in our country, we learned much and many things we missed to do. For the moment we have the most important thing – a large number of highly qualified personnel who know and can make the necessary for the modern building of the bases of a new R&D whose results to be successfully used not only for achievement of the planned national and allied defense capabilities but also for development of key for the country economy lines.

However, real accelerator of the need of a new R&D is the number of steps which undertook different bodies and organizations of the European Union in the field of security and defense. In the time 2007 – 2009 the European Defense Agency (EDA) developed a package of base-laying documents in support of the successful adoption of the Common external policy and policy of EU security, the European Security and Defense Policy and European Security Strategy, i.e. :

- **Capability Development Plan - CDP;**
- **European Defense Technological Industrial Base Strategy (EDTIB Strategy);**
- **European Defense Research & Technology Strategy (EDRT Strategy); and**
- **European Armaments Strategy.**

On that basis many EU member countries developed their own, national policies in the individual thematic lines of the security and defense. Where is Bulgaria in these fields?

In the beginning of 2009 IMS (CATAS) and Bulgarian Defense Industry Association elaborated a project of Strategy for the development of the Bulgarian defense-technological industrial base. On the base of the Project, on 14 June the same year, the Interdepartmental Council for the issues of the military-industrial establishment and the defense mobilization preparation of the country at the Council of Ministers made resolution that it is discussed by the engaged bodies and organizations from the governmental and non-governmental sector, under the leadership of the Ministry of economics, energetics and tourism, and to be submitted for adoption at meeting of the Council of Ministers. I.e., that is the first in the country attempt Bulgaria to become a part of the European family which has created a harmonious system of regulations in the field of security and defense. The next, not less important step is placement of new, modern bases of R&D in the defense sector and the sector of security (certainly, we do not neglect the remaining issues of these sectors that are not less important but **in no case more important**).

An attempt may be made for detailed analysis of the status quo and after the definition of the object of analysis – the research activity to the interest of the defense and security and its subject – the various accompanying problematic areas, to carry out a debate on theme „how far we are from carrying out modern R&D policy and what we should do in order to join the

big family of aware and capable NATO and EU partners”. Hundreds of pages shall be written with facts and conclusions that are well known by all specialists.

However, a brief but rich in content assessment of the major problem could be made and after that an accent is placed on the ways and means for its resolution. Therefore, the present paper aims at presenting the already adopted by the EU and the member countries mechanism of building and development of modern R&D, adequate and in support of the achievement of the national and European defense capabilities, i.e. creation and realization of national Defence R&D Strategy. It is necessary to unite around this model because every other “Bulgarian way” will only postpone and wash away in time the so required quick actions for modernization of this key sphere of the national security and defense.

BRIEF ASSESSMENT OF THE ACHIEVED

With the risk to repeat already said things or not to cover the entire set of R&D problems it is necessary to make again an attempt in the correct for its development direction.

For the purposes of the traceability and objectivity it should be noted that for the period from the beginning of the new millennium in the area considered many efforts were realized for a new qualitatively change of its parameters, such as:

- a) restructuring of the internal departmental system of the Ministry of Defense (MoD);
- b) training of the personnel for work in the new conditions;
- c) placing the bases of legitimate regulation of the processes; and
- d) recovery of the connections with the national scientific potential out of the MoD system.

Unfortunately, the efforts for change stopped here. In the above said period much was done in direction of the R&D development, two of the obligatory prerequisites required for achievement of success in this line being fulfilled besides all the other:

- Carried out structural and personnel changes; and
- The mechanism for the R&D system functioning was institutionally established through elaboration and publishing of a new Rules for R&D.

But the main thing, Policy for research and development activity to the interest of the national security and defense of the country was not developed and applied. Policy which would not be limited only in the frames of MoD but would cover the whole range of activities engaging, for instance, the Ministry of Interior, the Ministry of Foreign Affairs, the Ministry of Economics and energetics and other bodies and organizations. This led to extremely negative consequences. The latter immediately started to show their negative effect in short term plan. **In middle and long term outlook they could lead to impossibility to satisfy whatsoever needs of the Bulgarian Armed Forces by our native science and economy.**

What this conclusion is based on?

The lack of elaborated and applied Policy led to impossibility for purposeful, systematic and adequate support of the activities in compliance with the requirements for development both of the Armed Forces and of building and development of modern defense-technological industrial base. Thus for example:

- a) there is absolutely no idea which are the priorities of R&D in national plan and in the frames of NATO and the European Union;

b) there is no whatever written regulation for the purpose of the efforts in relation to the use of the newest achievements of the native science;

c) the necessary line of behavior and the purposes are not formulated and delineated in relation to our activity in such bodies and organizations such as the Science Committee in NATO, the NATO Research and Technology Organization, the European Defense Agency **(in these bodies work our representatives from various structures in the frames of an institution as well as from different institutions, between them connection and will for unification of the efforts not existing for carrying out united policy)**;

d) there are no whatever prerequisites for purposeful, **unified**, practice-applied and financially provided R&D Policy, engaged with the issues of the **anti terrorism – the main priority of Defence R&D for nearly all (not to say absolutely all) NATO and EU member countries.**

That is the **main problem** – the lack of R&D Policy to the interest of the national security and defense of the country!

The fact that Bulgaria participates in NATO projects **(and in some others of the Alliance or EDA)**, such as:

- Improvement of the helicopter protection against RPG;
- Harbor protection;
- Alternative of anti-personal mines,

does not mean that we have a clear idea where we are „heading for” in R&D, both in national and in allied and international plan.

Therefore, it is necessary to make a last attempt to line among the „aware and capable” in NATO and EU. Certainly, we are not insured against repetition of past mistakes and making new ones but the state of this field in the moment is below the critical point of existence.

WHAT ARE WE TO DO?

The reply to this question is obvious – we have to elaborate and put into effect **Defense R&T Strategy, as well as the documents**, accompanying its realization - normative, sub normative, plans, methodologies, methods and procedures! Everything else is details and components of this entity.

At the base of the strategy a complete change of the terminology should stay and in the first place the change of the term “R&D” which should be replaced by “defense researches and technologies” (R&T) using the definition in the „Indicators and Strategic Targets” of the European Defense Agency that defines the defense researches and technologies as: «..... **expenses for fundamental researches, applied researches and technologies and demonstrations for the defense purposes.**» The definition covers six levels of technological readiness (TRL 1-6) and **does not comprises costs for demonstrations or development of products and systems for which decision is made to be purchased.** Putting start of the changes by purification in terminology aspect is a guarantee for success of the efforts and not a serial Bulgarian attempt for «perfectness» in the improvement of certain field of the professional or social sphere.

Which are the prerequisites for development and application of Defence R&T Strategy?

a) Presence of **political will**. For the first time we are in situation in which the government clearly and categorically declares in its management program that they shall put

the adequate accent on the researches and technologies to the interest of the security and defense;

b) Presence of necessity of close **interaction** between the processes of achievement of the planned **operative** and/or **defense capabilities** and **initiatives** in the field of R&T. I.e., strong connection will be created between the „top-down” and “bottom-up” processes. At the moment there is a complete chaos in respect of R&T. Nearly 100% of the developed Bulgarian products and systems are realized at the international market because in Bulgaria there was no (and still there is no) a clear vision for what they should be used and whether we need them;

c) Presence of necessity **the Bulgarian enterprises in the defense industry** to find their **adequate place** in the **European defense-technological industrial base**, at the common **European market of defense products and systems** and from there at the international market of defense technologies, arms and machinery;

d) Sharp necessity of creating conditions for adequate participation in **joined projects** for R&T of **EU** and **NATO**. At this stage we not only have no joined bilateral projects for R&T but our participation in the NATO projects under the program of struggle against the terrorism is in question (however not through the fault of the executives). As far as R&T Joint Investment Programs of EDA is concerned Bulgaria does not participate in it at all. Thus the Strategy will not only give the directions but will also discipline the participants (first of all the state administration);

e) In Bulgaria there is no clear concept where is the **place of our country** in respect of Defence R&T (not only), in the EU sphere of R&T. In 2009 the European Defense Agency performed a study to find out the national defense industrial and research capacities of the member countries. The initiative was an attempt in support of the identified in CDP defense capabilities of EU; in this way for the first time defense capabilities, research and industrial capacities and requirements to the necessary for their achievements armaments got united and mutually entangled. For the moment, there is no whatever information about the scientific society in Bulgaria, for the development of the process as well as for the possibilities of influence on our part. The lack of information does not mean lack of data but lack of concept how these data to be used for R&T in favor of the national security and defense and in support of the EU defense capabilities. If this situation continues we shall turn out to be **dependent** on our partners not only in respect of the modernization of our army with **new arms** but also for the development of **the research and industrial potential**. From this point of view, the availability of Strategy will provide:

- In time concretization of the requirements to the defense-technological industrial base;
- Clear determination of the research and development lines required for the purposes of the defense and security uncovered by the civil sector;
- Identification of our capabilities, possibilities and priorities for participation in joint projects of NATO and EU.

What should be the Strategy range, what should be the basis of its elaboration?

First of all it should be noted that the elaboration and adoption of Defence R&T Strategy should not wait “in the queue” of the base-laying documents which the new Bulgarian government has to prepare – National Security Strategy, Military Strategy, Military Doctrines, etc. There should not and may not be a **hierarchical dependence** between the documents in this field (national security and defense); solely and only **mutual commitment between**

them. In practice this means that the elaboration and adoption of the documents describing the policy and regulating the requirements to the individual components of this area could be performed in parallel (not in succession) and they should not wait one for the other. We have to simply describe and build solid “bridges” between every one of these documents. Solely determinative is the document (independently of its title) which will describe the national defense capabilities to whose interest the research and technological industrial capacities of the country will be ensured, but it also could not be “first” and all the rest “after it”; it is one of the entity and not the whole entity.

May the Defence R&T Strategy be a part of another strategic document from the above said? It may, but it should not because every simplification of the matter, including by its description as a part of another documental base, will not provide possibility to be thoroughly presented (the efforts will be directed to the “higher” problems), will impede its fulfillment and in the long run will remain only “on paper” (for the time in row). It is just necessary the strategic frame, presented in the project of **Strategy for the Bulgarian defense-technological industrial base**, in Section “Defense researches and technologies”, to be detailed in the appropriate lines.

1. The Strategy should comprise, but not be limited to, the following basic sections:

a) expected results, in the form of directions for technological solutions, in concrete areas of R&T, for the achievement of concrete operative and/or defense capabilities;

b) the **means** for creation of conditions for the development of the technologies – the limiting bench-marks, mechanisms, processes and structures which will apply them;

c) the **methods** to put the Strategy in action, including (but not only) the necessary documental base, the responsibilities of the individual participants, time periods, etc.

2. In the base of the Strategy development should lie:

a) the **available technological advantages** of the Bulgarian industry (incl. also the Research and Development Organizations in it), which can ensure the achievement of national and contribute to building of European defense capabilities and/or operative capabilities of the NATO forces. At this stage there are no thorough analyses which precisely are our technological advantages in the defense sector;

b) the vision about the new technologies that we can and have to elaborate for providing national and European defense capabilities and/or operative capabilities of the Alliance Forces;

c) the vision about the necessity of developing technologies of double use that will bring both defense and economical benefits and advantages;

d) the vision about the conditions and environment for establishment of cooperation in national, European and International plan;

e) the vision about good management and improvement of the R&T effectiveness. There are many ways and methods for the fulfillment of this task which is in the base of the stable Defence R&T development and the successful achievement and use of the planned in advance results. The vision should include, but not been limited by, the following elements:

- Formation of **clusters**. The cooperation between the enterprises both from the defense and from the civil sectors, for the purposes of the security and defense, and the creation of inter-company units and chains with participation of **research and development teams**, is one of the possibilities for accelerated progress of Defence R&T and realization of the results from them. The main advantages that will be achieved are:

- Ensuring access to innovations, knowledge and know-how;
- Formation of more effective, more stable and competitive research and production economic subjects.

As far as the benefits which will be achieved are concerned, these are the unchanging benefits from the activity of these business units – more effective transfer of the scientific product in technological and production solutions; more effective business transactions; decrease of the costs; better conditions for investments and development and growth of the employment possibilities.

However, in order to achieve this it is necessary to establish serious engagement on the part of the governmental bodies and organizations, directed to the formation and growth of the clusters, in the security and defense sectors, for more effective and adequate to the governmental policy for Defence R&T management and partnership. This should be the basic purpose of this section – detailed description of the state commitment;

- The conditions of active attracting the **Bulgarian scientists** from the national research teams for resolving the problems connected with the security and defense. At this stage, on the background of the extremely low levels of Defence R&T financing, the scientific potential is not only unused but there are many cases when problems in these fields are assigned either to companies with proved low scientific capacity or to ones which have nothing in common with the scientific themes that should be investigated and developed. Strategy base should become the requirement:

- Where it is possible, advisable and effective, Defence R&T should be carried out by Bulgarian scientists from the national research teams and organizations;
- Where the development is not possible by Bulgarian scientists, all Defence R&T results, required for the achievement of capabilities, obtained from joint European and/or international projects or taken as final solutions, should become known by the scientists from the relevant research fields working in national research teams engaged with the security and defense issues. Only in this way the so necessary prerequisites will be created not only for their single use but for generating possibilities for adoption and development of new technologies and acquisition of know-how as well;

- Mechanism of **prediction, timely definition, planning and declaring the needs** from Defence R&T. To obtain a scientific product depending on the specificity of the research field requires ensuring long time periods (sometimes from 3 to 5 years);

f) the vision of the national scientific potential training and development to the interest of the security and defense. The national cadres' scientific potential in the defense industrial sector and in the security sector is carrier of the ideas and creator of the results. The formation of a harmonious system for their training, stimulation and development in compliance with the concrete necessities in these sectors will contribute to saving the acquired knowledge, experience and know-how and will attract new scientific, engineering and executive personnel

putting the future of Defence R&T and the Bulgarian defense-technological industrial base on solid foundation.

The documents providing the matrix of possibilities for application of the above said basic means for the Strategy elaboration could be (but not only):

- The results of the Defense Strategic Review (the available or a new one);
- Strategy, Conception (or the name it will be given) of national security and defense;
- The Force Goals;
- The program and projects of RTO (NATO R&T Organisation);
- The program and projects of NATO C3 Agency;
- The NATO Defence Against Terrorism Program;
- The Capability Development Plan – in particular, the identified twelve areas of EU required defense capabilities;
- The EU list of priority technological solutions which lies at the basis of the European Defence R&T strategy (and the European strategy itself);
- The European Defense-Technology Industrial Base Strategy;
- The Strategy for the Bulgarian Defense-Technology Industrial Base development;
- The list of key technological advantages of the Bulgarian defense industry (should be made).

**How the key technological solutions towards which we have
to direct our efforts could be identified?**

As it was noted in the beginning, the Defense R&T products – technological solutions, are resultant of the determined in advance operative and/or defense capabilities. On the basis of the problematic areas identification, to satisfy the capabilities, the means and mechanisms for their overcoming are determined. This is the standard approach which forms the long term perspective for the development of the capabilities.

But is it necessary to wait for the detailed definition of the capabilities and the related with them problematic areas? In the ideal case that is imperative. But what to do until all the envisaged by the theory activities for achieving the described in it theoretical postulates are fulfilled (taking into account the fact that this process may prolong in the frames of several years)?

This dilemma is resolved in different ways but a possible one is performing certain number of “brainstorming” on concretely defined themes through which the key future capabilities and capacities in the Defense R&T field to be projected. This is possible at least because there is sufficient in number qualified personnel (noted above).

For the purposes of the objective carrying out of this process it is necessary the efforts made to be based on mutually coordinated criteria, such as for instance:

a) technological progress which could change the requirements or generate new capabilities (defense and industrial) and which could contribute to significant changes of the Defense R&T capabilities and capacities;

b) identification of such research and technological skills that are required for ensuring the Armed Forces capabilities;

c) consolidation of the defense-technology industrial base for the purposes of the relative detachment and operative independence;

d) identification of effective cooperation possibilities taking into account factors such as:

- The degree of the relative autonomy, that we think desirable to achieve in the considered area;
- The degree of technical readiness which we will strive to achieve independently and/or in cooperation with the NATO and EU colleagues;
- Whether the corresponding area limits the cooperation or permits a broader one;
- The cooperation conditions;
- The assessment of the fact if the benefits of such a cooperation exceed the internal organizational (or of other nature) difficulties of its realization;
- The assessment of the asymmetric progress of the NATO and EU member countries from the view point of the capabilities for Defense R&T, financing and the national industrial capabilities;
- The opportunities to be included at the earliest possible stage in the delivery of the technological solution results for satisfying the needs of the corresponding user.

However, what could we say, as earlier as this stage, about the reached technological levels by the Bulgarian industry on the base of which our efforts for identification of key technological areas towards which our state to direct in future its Defense R&T Policy may be founded? If we take for starting point the European Capability Development Plan and particularly the twelve functional areas in which the EU defense capabilities should be built we shall see that in the areas:

- **Mine Counter-Measures in littoral sea areas** (we possess high technologies for underwater protection of littoral territorial areas);
- **Comprehensive Approach - military implications** (we possess various leading technological solutions in the ammunitions, optics, communications, etc.);
- **Counter-Improvised Explosive Devices** (we possess a world leading technology for counteraction against improvised explosives radio channel remote blasting);
- **Increased availability of helicopters** (we are leaders in the helicopter protection against RPG),

The Bulgarian companies have a number of technological solutions that could underlie in the bases of satisfying the national and contribute to the building of the European defense capabilities.

On the other hand the identification of the key technological solutions towards which to direct our efforts should take into account that in the areas (just for example) such as:

- **Biotechnologies, food and health** - we possess a leading at world level food lyophilization technology. It could be successfully used to provide the military

feeding during execution of missions and tasks abroad (provided the food of many missions in the space);

- **Material science and nanotechnologies** – we are leaders in respect of helicopter protection against RPG or in certain areas of optics;
- **Information and communication technologies** – we have the leading in the world technology for counteraction against improvised explosives radio channel remote blasting,

we have achieved successes which could be used not only to ensure national but to contribute to the achievement of European Defense Capabilities.

The fact that the above said research fields are part of the priority scientific areas in which the efforts of our native science, under the leadership of the Ministry of education, youth and science – National Science Fund, respectively – should not be ignored. The identification of the research priorities in the security and defense, taking into account the achievements and priorities of the national science, will ensure us advantages such as:

- ensuring larger and complex satisfying of the national defense capabilities and the armed forces operative capabilities;
- adequate „positioning” in the frames of NATO and EU in the considered area;
- ensuring numerous additional effects with concrete economical benefits.

What benefits will the Strategy bring us?

The general benefits which the elaboration and adoption of unified and purposive Defense R&T Strategy will bring us will be at least:

a) presenting the governing bodies a possibility to have clear idea about the most effective means and methods for spending the Defense R&T intended finances – with whom, when and what to achieve. The duplication of the efforts in national plan with those at European level in the preparation and realization of R&T projects will be reduced to a considerable degree. At the same time we shall specialize in small in number developments but of significant potential of the final product contributing both to ensuring advantages in certain defense capabilities and to achievement of important economical benefits for the country;

b) the defense-technology industrial base will possess the necessary for it in-time information for restructuring and development of the promising at national and international level defense products. Considerable financial resources of the firms will be economized for development of products and systems that do not have the required characteristics and parameters for reaching the operative and defense capabilities. They will be given the chance to improve their competitiveness both to establish stable leadership at the international market niches and to occupy leading positions of first sub-contractors for the world leading companies in the defense sector (Sub-supplier 1 in the supply chain).

If we try to concretize the beneficial effects we could declare with high degree of certainty that the adoption of Defense R&T Strategy shall:

a) create the so needed environment for **defense industrial sector integration** with the rest of the sectors of the national economy. It is not possible and we should not think that solely and only the engaged with the security and defense production economical subjects are able to offer alone the whole range of technological solutions for ensuring the operative and

defense capabilities. Without the establishment of permanent, constructive and based on the country strategic interests dialog between these two parts of the economy (defense industry and the so called “civil” industry), with the active mediation and leadership of the state, whatever aims and tasks we set in relation to the security and defense will remain imaginary ideas.

On the other hand, the integration of the efforts of the research and development organizations of the defense and civil sectors for generating the necessary innovative solutions for the purposes of the operative and defense capabilities will be the basis for achievement of the desired results. The above and this necessity (integration of the efforts of research and production subjects in the defense and civil spheres) at this stage of our development are missing as requirements to the administrative bodies and organizations and they are not an object of their policy.

The close integration between the research and production sectors in the defense and security with the civil research and production-economical activities is a necessity which long ago “knocks on our door” and it is a corner-stone for guaranteeing the successful achievement of the capabilities. Basic components of this integration could be: the more and more growing trend to use already available civil products and technologies for the purposes of the security and defense; elaboration of a complex of documents focused on the conditions for creating synergy from the integration of both parts for future benefits for the civil as well as for the “military” areas, etc.

Key way to reach this aim (the integration) is building Centers of excellence that shall unite the efforts of both parts by including in their activity industry, research organizations, universities, etc. But Bulgaria is a small country and therefore it is inexpedient and economically ineffective to have numerous centers in the areas considered. Led by this understanding, at the end of 2008, in compliance with the NATO and EU requirements, the Institute of Metal Science, the Academy of the Ministry of Interior and Plovdiv University “P. Hilendarski” founded the first Center of excellence in Bulgaria, in the security and defense – the Center of Anti-Terrorist Advanced Systems. On that basis our country may become a part of the NATO network of Centers of excellence (currently there are 18 centers) and to establish strong and stable interrelations with the centers from the EU member countries (Defence Technology Centres, Tower of Excellence, etc.).

b) provide conditions to accelerate the **technological development** in selected, key for the defense and security areas. There is a necessity of establishing a balance between the formulation and achievement of operative and defense capabilities and the significant technological achievements that are available or could be a result of different project initiatives (frequently the products of the researches and the new technologies lead to unexpected applications). Therefore, often the requirements to the capabilities could not determine the whole range of Defense R&T activities. Thus the Defense R&T are determinative source for decision making and formulation of the capabilities. Therefore the Strategy may and has to lay the bases both for active engaging of civil scientists and researchers in solving concrete “military” problems and for engaging of Bulgarian scientists in international teams for achievement of scientific results on reaching the respective capability. In order that this notion does not remain only “on paper” it is necessary the Strategy clearly and accurately to describe the areas, aims, time and other frames in the requirements this to happen.

c) improvement of the Defense R&T **effectiveness**. Main instrument for achievement of this purpose is carrying out regular analyses, the starting points of which should become:

- the consolidation of the defense-technology base for achievement of the capabilities. In order that this is achieved two obligatory conditions have to be fulfilled: creation and development of reliable mechanisms of cooperation between the state administration and defense industrial sector; and specifying permanent, inviolable amount of the R&T financing as a part of the country defense budget. At this stage there is no any written regulation for the financing of these activities. This fact has led to the situation that in the years the finances go down to 0,019 % of the MoD budget and for the next years, with high degree of approximation, it could be claimed that this percentage tends to the absolute zero. In this relation, the Steering Board of EDA accepted in 2007 the Defense R&T financing of the EU member countries to be 2% of the respective defense budgets, and 20% of them to be granted for joint European project financing;
- improvement of Defence R&T management. The elaboration of the planning process, adoption of the best practices in this field (European and international), establishment of the monitoring process of the entire activity as an information source not only for the process state but also for the realization of the Strategy as a whole as well as the necessity of its advance could and should become the mainstays for increase of the Defence R&T effectiveness;
- creation of adequate and stimulating environment for establishment and development of cooperation at national, European and international level for Defence R&T with the purpose of resources optimization and avoidance of undesired duplications of efforts. However, that this becomes true and that we shall not be witnesses again of good intentions only, without real practical results, the following thematic lines should be taken into account as well as the fact that they are mutually dependent and the success of our undertaking will depend on that if they are actively included in the environment formation:
 - exerting serious, thorough and steady efforts for the transformation of the operative and defense capabilities in adequate and understandable Defence R&T purposes. The most difficult part of the task to make an efficient Strategy. Up to now the people who formulate the operative and defense capabilities in our country do not work together with those who have to make Defence R&T in support of reaching these capabilities. We miss experience for the translation of the first in understandable aims for the second;
 - increase of Defence R&T transparency at all levels. This activity cannot be „classified”. If we make the effort to look in the EDA or RTO sites for instance, we shall see that the programs, projects and plans of these leading organizations are accessible for the general public, certainly in the adequate volume;
 - creation of procedure for identification of the points of contact and the possibilities for synergy between the products of the different documents contributing to building a solid and stable security and defense. For example, establishment of the Defence R&T Strategy as constituent part of the National Research Strategy and the accompanying it processes of planning and project realization;
 - creation of stimulation mechanism of cooperation for the engaged in the defense and security research and development organizations with the analogical bodies and organizations in the civil sphere, with the defense

industry and the rest of the sectors of the economy, with the European and international (incl. NATO) research and production organizations;

- formation of a network of leaders and specialists, motivated to work for the execution and development of the Defence R&T Strategy;
- development of unified method for acceleration of the new technologies inclusion in the programs and projects. We have to create feedback between the Defence R&T programs and projects, the results of which could generate new capabilities and present in practice how the technologies can be projected in operative and defense capabilities. The acceleration may be supported not only by development of new products but also by competent statements presented to the decision makers concerning the capabilities, training, etc. matter.

HOW TO DO THIS?

In practice, this is one of the most important questions which is easy to be answered but it is also very easy to make a mistake. Therefore, it is necessary to unite around creating a mechanism which to guarantee timely and good quality development, approval and execution of the Strategy. If we wish that to happen then this mechanism should comprise (besides all other items) formation of a work group based on the following principles (but not only):

- permanent strive to **avoid theorizing of the problems**, the formation of conditions for creation of modern practically applicable document being the leading principle;
- **equal number of representatives from all bodies and organizations** – governmental and non governmental, engaged with the Defence R&T issues. Further to the representatives of MoD, a good quality document could not be elaborated without the participation of specialists from the Ministry of Interior, Ministry of Foreign affairs, Ministry of Economy, Energetics and Tourism, Ministry of Education, Youth and Science, Ministry of Agriculture and foods, Ministry of Transportation, Information Technologies and Communications, National Security State Agency, Bulgarian Defense Industry Association;
- **equivalence of the participants** in the process of the Strategy preparation and adoption;
- representatives of **vicarious authority** (in the general case, the work group makes certain decisions, everybody vote „positive”, later after “thorough analysis” in the respective organization the respective representative changes his opinion);
- application of the **good practices**, adopted in the EU and NATO member countries, and not “adaptation” of the “best” from all;
- **maximum transparency** in the Strategy preparation and adoption (to permit not, due to misunderstood „confidentiality”, restricted propagation of the necessary information for correct decision making).

If we succeed to make similar model for the development and adoption of defense researches and technologies Strategy then and only then we shall be certain of the final success of the undertaking. The other method, elaboration of the basic document by a small group of specialists and its subsequent discussion at “round tables” is an approach that has proved its inefficiency (a considerable part of the above said principles are either not applied or subjectively ignored).