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A Methodology for Strategic Defense Review and its Governance System. (Prototype)

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***Abstract*—This article is part of a series describing the capability-based defense planning model. This model has been adopted as the primary methodology for conducting Strategic Defense Reviews in the Republic of Bulgaria. The proposed prototype for conducting strategic defense reviews follows a sequence of abstract steps to achieve adequate defense capabilities for the armed forces. The article focuses on the planning process within the Ministry of Defense and the Bulgarian Army and includes a model of the activities, information flows and links, and other elements of the process. The activities of the planning process are decomposed to the third level, which completes the design of the system. The functions of the participants in the process and their responsibilities at the various levels of management are described.**

The proposed methodology is based on modern scientific and analytical methods. It was validated during the Strategic Defense Review conducted in 2019.

Keywords— Strategic Defense Review, Defense Planning, Model of a Complex Organizational System, Process Modeling.

I. INTRODUCTION

The achievement of the planned level of effectiveness of defense decisions related to the development of the necessary defense capabilities depends to a significant extent on and is determined by high-quality defense planning and the implementation of the transformation of the armed forces. This aspect is of particular relevance given the uncertainty of the future security environment. Preserving and developing defense capabilities in response to threats and commitments to national and global security, under conditions of severe constraints on available resources, necessitates the search for adequate methods to enhance the effectiveness of the defense planning process.

The Strategic Defense Review (SDR) is a key process for analyzing the country's defense capabilities in light of current security threats. SDR aim to identify shortcomings and deficiencies, address these weaknesses, and set realistic goals for enhancing the capabilities of the armed forces so that they meet national and coalition political-strategic requirements. All of this must be done within the framework of available

resources, minimizing the likelihood of spending funds on capabilities that are not essential and do not contribute to

achieving the set goals. In other words, the results of the SDR must present the overall state of defense as part of national security, so that the prospects for its development are outlined in a manner that is understandable and transparent to the public.

The Strategic Defense Review is a complex process, the success of which depends on a number of factors related to the organization of activities, the selection of an appropriate methodology for its conduct, the establishment of procedures, schedules, resources, and conditions for implementing the activities of the defense planning process, and, last but not least, the motivation and preparation of the personnel who will participate in it.

The choice of an appropriate methodology for conducting a Strategic Defense Review was one of the tasks set by the political and military leadership of the Ministry of Defense of the Republic of Bulgaria. For this purpose, the planning approaches most commonly used in NATO member states were examined, known in the literature as: 1) Top-Down planning; 2) Bottom-Up planning; 3) Scenario-based planning; 4) Threat-based planning; 5) Mission-Based planning; 6) Hedging—an approach based on risk reduction or complete risk control; 7) Technological approach; 8) Financial (or "Budget") approach [1].

Each of these approaches has distinctive features, with their respective strengths and weaknesses.

The process of capability-based defense planning is a variation of some of the approaches listed above. It is a key planning tool that reflects the characteristics of the

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contemporary security environment. The goal of this process is to protect and advance national interests by building, maintaining, and utilizing defense capabilities appropriate to the security environment. It is for this reason that the leadership has chosen this approach as the mechanism for conducting the upcoming Strategic Defense Review.

The capability-based defense planning process has been in use at the Ministry of Defense and the Bulgarian Armed Forces since 2012, when a methodological guide for implementing this approach was first developed. The realities of the environment, as well as the results of past strategic defense reviews, have necessitated an analysis of the existing "Capability-Based Defense Planning Guide" from 2012, with the aim of updating and improving it.

As a result of the analysis of the 2012 Planning Guide, a number of shortcomings were identified, including: the lack of regulated relationships between performers; the lack of defined responsibilities for officials; "parasitic" activities that do not add "value" to the defense planning process, incompatibility between national defense planning and NATO capability planning has been restarted. The "Planning" stage of the process was not described, nor was the "Project management" stage; the process activities were not correctly visualized, and the responsibilities of the individuals participating in the process have not been specified.

The main conclusions of the analysis are that the model of activities in the planning process 2012 is inconsistent, incomplete, and does not correspond to the current defense management system. Therefore, in its current form, it cannot be used as a methodology for conducting the future defense review.

With the aim of addressing the identified weaknesses, the model was revised and refined into a "To-Be" model of the future state so that it integrates and reflects all key functional and systemic perspectives of defense management.

The methodology follows the recommendations from an analysis of the existing defense planning system. The identified shortcomings and gaps, primarily related to the lack of compatibility between the specific characteristics of national defense planning and the armed forces and the requirements for NATO collective defense planning, have been addressed. Changes to the regulatory framework (primarily the Ministry of Defense's Rules of Procedure) related to the duties and responsibilities of officials have also been reflected. Activities have been added for: 1) long-term defense planning; 2) project management; 3) research and development (R&D); 4) life-cycle management. Mechanisms have been established to enhance oversight, ensure the fulfillment of the country's commitments to NATO and the European Security and Defense Policy (ESDP), and synchronize the planning process with analogous processes in NATO and the EU. The goals, stages, and activities of the process are clearly described using standard notation for process description and visualization. Activities that do not provide real "added" value to the process in terms of enhancing the capabilities of the armed forces have been optimized, and the relationships between the performers have been redesigned in accordance with their responsibilities.

The methodology presents the process through a series of decomposed activities with their respective inputs, outputs, and participants. Changes have also been made to the names of the process' elements. The terminology has been refined and standardized. As a result of these changes, a fully completed prototype has been developed, providing a detailed description of the process, products, organizational structure, relationships and responsibilities of officials, to ensure effective integrated planning and capability development in response to the changing operational environment.

The methodology regulates defense planning as a specific activity carried out within the Ministry of Defense, aimed at defining, building, and developing the necessary capabilities and the associated human, financial, material, and other resources and services to achieve defense objectives in fulfillment of the Republic of Bulgaria's obligations within collective security and defense systems. This prototype presents: 1) defense planning as a process; 2) the logical link between national defense policy and strategic documents related to the country's national security and defense, and the defense capabilities necessary to achieve the objectives and priorities set forth therein; 3) capability planning activities; 4) the main participants in the process and their responsibilities.

II. Materials and Methods

To identify realistic solutions when designing the system architecture, formal methods for description and analysis were employed, including mathematical and logical techniques, as well as descriptive languages and tools for the development and verification of complex systems. These methods and techniques are characterized by a high level of precision, aimed at ensuring the adequacy of the system design and avoiding errors in it. The following main formal methods and tools were used:

- *IDEF0 diagrams.* The activity model was visualized using IDEF0 diagrams. IDEF0 belongs to a family of modeling languages that cover a wide range of applications—from functional modeling to data modeling, simulation, object-oriented analysis/design, and knowledge acquisition. A fundamental principle underlying IDEF0 diagrams is the principle of activity decomposition. Activity decomposition is the breakdown of processes into their constituent activities. The result is a tree-like structure representing the activities required to solve a given problem. The IDEF family integrates methods ranging from IDEF0 to IDEF14 [2]. The figures in this article were created using CASE (Computer-Aided Software Engineering) [3] tools based on the IDEF0 standard.
- A validation of the overall model, with a complete decomposition of the activities, was accomplished using the Visual Object Net++ Evaluation Version 2.0.

- The models presented in the methodology have been examined for completeness and consistency using a separate methodology that includes descriptive and analytical tools such as Evaluation Nets, algorithm flowcharts, tabular algorithm flowcharts, and matrix algorithm diagrams (MAD). An example of this proof is given in [4].

III. Results and Discussion

METHODOLOGY FOR CONDUCTING A STRATEGIC DEFENSE REVIEW AND THE SYSTEM FOR ITS MANAGEMENT

The methodology presented follows the capability-based defense planning process of the updated To-Be model.

This process is a key planning tool in the contemporary security environment, characterized by extreme dynamism, blurring of boundaries between internal and external security, and broadening of the spectrum of identified threats. The goal of this process is to protect and advance national interests by building, maintaining, and utilizing defense capabilities appropriate to the security environment, and by establishing interoperable, modern armed forces with a unified command and control system in peacetime and during crises [5].

A key stage in the defense planning process is identifying the capabilities that will be required for current and future operations over the next ten to fifteen years. For this reason, operational planning is a primary tool for determining the necessary capabilities. Through this process, the defined national strategic objectives are broken down into military objectives, potential operations, and tasks, which in turn are broken down into the forces and assets required to execute these tasks in operations. Given that "The defense of the Republic of Bulgaria is a system of political, economic, military, social, and other activities aimed at ensuring a stable security environment and at preparing for and carrying out the armed defense of the territorial integrity and independence of the state," capability-based defense planning, together with the planning and conduct of operations, are systemic determinants of the country's defense [5].

A. Restrictions

Within the overall capability-based defense planning model, the methodology for conducting Strategic Defense Reviews and the system for managing them focuses on the activities "Formulation of Defense Policy" and "Capability Planning" (Fig. 1). The remaining activities in the process are related to the implementation of decisions from previous strategic reviews or define the input parameters from the previous planning cycle, such as the financial framework, the Government Program, the Current Program for the Development of the Armed Forces, modernization and rearmament projects implemented to date, etc.

B. Assumptions

The methodology has been adapted to the current defense management system, including applicable laws and regulations, and meets the following requirements: 1) to correspond to the strategic plans of the organization, 2) to allow for continuous change and transformation, 3) to provide standard descriptions and a common working environment, 4) the model's outputs must objectively reflect information flows within the organization, 5) control mechanisms must be established to prevent management from implementing incompatible decisions.

C. Formulation of Defense Policy Stage

Defense policy serves as the starting point for initiating and conducting the defense planning process. Defense policy is a sectoral component of national security policy and constitutes a set of coordinated objectives and institutional and civilian actions aimed at developing, improving, maintaining, and utilizing defense capabilities to protect national interests [5].

The primary objective of defense policy is to create conditions for the optimal use of the armed forces within the context of national security policy, taking into account the strategic security environment, the country's resource capabilities in the medium term and their projected development in the longer term, and our participation in NATO's collective defense and the EU's Common Security and Defense Policy [5].

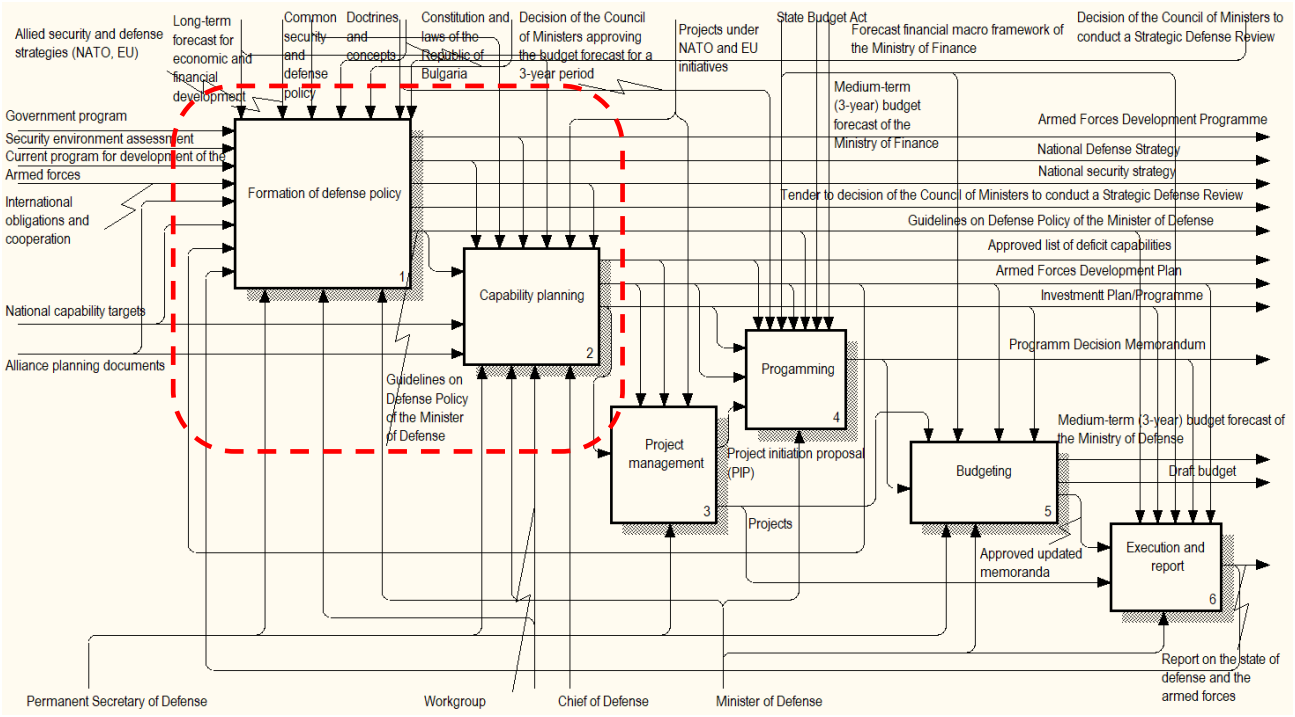

Fig. 1. A0 Model of capability-based defense planning processes

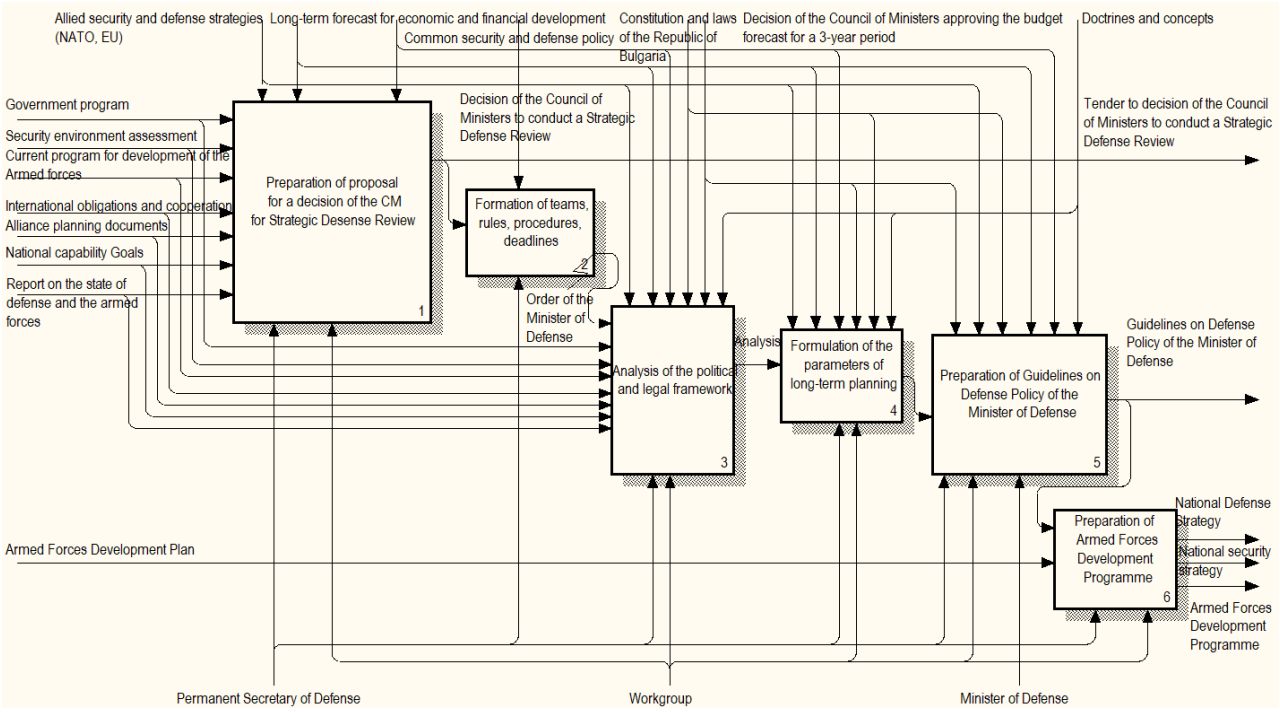

Fig. 2. Stage A1 „Formulation of Defense Policy”

The main deliverables from this stage are: 1) Proposal for decision of the Council of Ministers to conduct a Strategic Defense Review; 2) Guidelines of the Minister of Defense on the Defense Policy; 3) National Defense Strategy; 4) National security strategy; 5) Armed Forces Development Programme (Fig. 2).

A proposal to conduct a new Strategic Defense Review is made prior to the expiration of the relevant planning period or in the event of a change in the security environment.

The Guidelines on Defense Policy serve as the primary framework document in the defense planning process and mark the beginning of a new planning cycle. When conducting a strategic defense review and/or periodic defense reviews, the Minister of Defense issues guidelines for conducting a strategic review and/or defense review. The guidelines include information necessary for the overall planning process, namely: an assessment of the security environment, the level of ambition for the use of the armed forces (AF), the role of the armed forces, defense policy priorities, the titles of the general planning scenarios, an estimated financial framework, strategic planning assumptions, and constraints.

One of the mechanisms for aligning the national defense planning process with the NATO Defense Planning Process is precisely the Guidelines on Defense Policy. Therefore, their development must begin as soon as work starts on drafting the NATO Political Guidance. Another such mechanism is adopted National Capability Goals.

The Armed Forces Development Programme is the primary conceptual, strategic, and programmatic document for national defense, with a long-term nature and a 10–15-year horizon. It defines the parameters for development and the main guidelines for building the defense capabilities of the armed forces. It aims to achieve broad public and political support, continuity, stability, consistency, and sustainability in the implementation of defense policy and the development of defense capabilities in the long term, beyond the terms of the current government and parliament [5]. The Armed Forces Development Programme contains:

- conclusions from the assessment of the security environment and their impact on the development of defense capabilities;
- foundations of defense policy (principles, strategic objectives, and priorities);
- general requirements for defense capabilities;
- guidelines for the development of the Armed Forces' defense capabilities;
- macro-level resource framework;
- key objectives of defense policy.

Another key document from this stage is the National Defense Strategy. It is updated as necessary during the strategic defense review. The National Defense Strategy is reviewed by the Defense Council (DC) and adopted by the

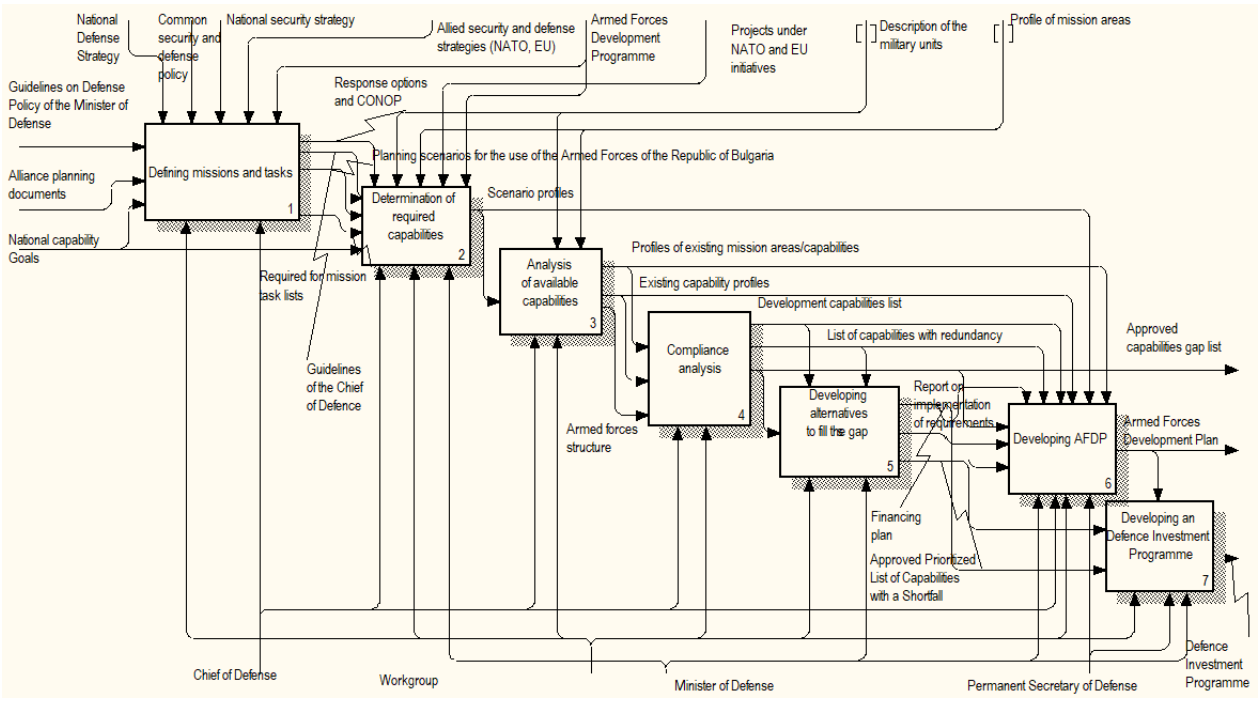

Fig. 3. Stage A2 „Capability Planning"

Council of Ministers upon the recommendation of the Minister of Defense.

D. Capability Planning Stage

In the Capability Planning Stage, changes in the security environment and political decisions are transformed into the capabilities required to achieve

defense objectives. This stage includes the following activities, which are presented in Fig. 3:

1. Defining the missions and tasks of the armed forces;
2. Determination of required capabilities;
3. Analysis of available capabilities;
4. Compliance analysis;
5. Developing alternatives to fill the gaps;
6. Developing an Armed Forces Development Plan (AFDP);
7. Development of Defense Investment Programme.

The essence of this stage is to identify the defense capabilities that will be required over the next 10–15 years and to draw up a plan for their maintenance, development, and acquisition.

This stage is repeated every four years (during strategic or periodic defense reviews) or, if necessary, every two years.

The deliverables of this stage are: 1) Armed Forces Development Plan; 2) Defense Investment Programme; 3) Approved Capabilities Gap List.

The Defense Secretary directly oversees and is responsible for defense planning. At this stage, the Chief of Defense directly oversees and is responsible for determining the necessary defense capabilities, coordinating with the Minister of Defense on the main military-political objectives, military-political scenarios, and the principles under which the country's military and civilian capabilities are used for its effective defense.

1. Defining missions and tasks of the armed forces.

This step aims to identify the capabilities required to achieve defense objectives and fulfill the Republic of Bulgaria's obligations within the collective security and defense system. It includes the following activities [5]:

- developing directives from the Chief of Defense;
- developing planning scenarios;
- developing courses of action and concepts of operations;
- development of task lists.

The required capabilities are defined as the capacity to perform the tasks/actions necessary to achieve the objectives of potential operations in response to probable threats and in fulfillment of the Republic of Bulgaria's obligations within the collective security and defense system.

To this end, the threats identified during the security environment analysis are further developed into situational scenarios, based on which response options and operations to be conducted to achieve national objectives are determined. Subsequently, based on existing conceptual and doctrinal documents (guidelines, internal/operational tactics, techniques, procedures, rules, etc.), the tasks and actions required to carry out these operations are defined.

2. Determination of Required Capabilities.

In this step, the tasks/actions identified for execution are grouped by similarity (by domain) and by the structures (formations) that will execute them within the approved planning scenarios [5].

This step involves:

- developing or updating mission/capability areas;
- defining scenario profiles;
- review by the Defense Capabilities Council (DCC).

3. Analysis of available capabilities.

The analysis of available capabilities is an activity aimed at:

- describing existing capabilities;
- analyzing and assessing the existing structure of the Armed Forces for the execution of tasks in operations.

As a result of these activities, three main documents are developed:

- Profile of existing mission/capability areas;
- Profile of existing capabilities;
- Structure of the Armed Forces

4. Compliance analysis.

The capability assessment includes the following activities [5]:

- identifying areas where existing capabilities are sufficient - These include available capabilities for which (from previous defense reviews or the current Armed Forces Development Programme) a political-military consensus on their development has already been reached and they have been identified as necessary within the current defense planning process. This also includes those capabilities for which the life cycle of weapons, equipment, or systems is set to end within the next ten years. As a result of this list, funds are being planned/budgeted for their maintenance and development;
- Identifying areas where existing capabilities are in surplus. Surplus capabilities include those that are currently available but exceed, in terms of quantity or quality, the levels deemed necessary within the current defense planning process, and capabilities for which weapons, major equipment, or equipment are at the end of their life cycle or for which modernization is not financially feasible to meet the requirements of the tasks being performed. As a result of this list, funds are planned/budgeted for the decommissioning of existing capabilities, the termination of ongoing projects, or the development of new ones;

- Identifying the shortfall in the capabilities required by the Armed Forces to carry out their assigned missions and tasks. This includes capabilities that must be developed because they are not currently available but have been identified as necessary within the current defense planning process. This also includes capabilities that are currently available, but for which weapons, major equipment, or systems are at the end of their life cycle or for which modernization is not financially viable to meet the requirements of the tasks being performed;
- Prioritization of capabilities. Capabilities are prioritized according to their significance for achieving the desired end result within the scenarios and according to a separate methodology [6], which generally defines: the weighting parameters of the required capabilities and the importance parameters of the required capabilities that are in short supply. The output of this stage is a prioritized list of capabilities;
- Approval of the list. The prioritized list of capabilities is developed within three months of the approval of the scenario profiles by a Joint Planning Group, reviewed by the Joint Staff, and approved by the National Security Council.

The Chief of Defense, together with the Secretary of Defense, oversees the implementation of the activities.

5. Developing alternatives to fill in the gaps.

The development and selection of options involves the following activities:

- Developing options to address capability gaps. This step identifies the human, financial, material, and other resources and services that will be used to maintain, build, and develop the necessary capabilities. This step marks the transition from capability planning to resource planning, as the identified required capabilities are transferred into required resources and compared with the country's resource capacity to provide them. In this process, the overall financial framework presented in the Defense Policy Guidelines is allocated to support existing capabilities and address capability gaps. The capability shortfall is calculated as the sum of capabilities in deficit and capabilities requiring development (modernization or replacement of weapons, equipment, and materiel).
- Development of detailed options. The various options are further refined by the Joint Planning Group so that they are sufficiently clear to enable the forecasting of the resources required for their implementation. The options are analyzed and refined based on: 1) the availability of resources and 2) the extent to which they can be implemented (politically, militarily, and technologically) to address the relevant capability shortfall within the required timeframe and to meet the established standards.
- review by the Armaments Council (AC);
- review by the Program Council (PC);
- review by the DCC.

6. Developing of an Armed Forces Development Plan.

This stage includes the following activities:

- Development of AFDP. The Armed Forces Development Plan defines: the organizational structure, command and control bodies, chain of command, strength, deployment, armaments, equipment, and material resources of the military units and structures of the armed forces, as well as the voluntary reserve of the armed forces. The Plan covers a ten-year period and is developed, amended, or updated during a defense review (every 4 or 2 years). It is adopted by the Council of Ministers;
- review by the Security Council;
- submission for coordination and approval by the Council of Ministers of the Republic of Bulgaria.

7. Development of a Defense Investment Programme.

The Defense Investment Programme (DIP) aims to ensure the acquisition of the "hardware" component of the capabilities outlined in the Armed Forces Development Plan. The DIP is developed largely on the basis of concepts with selected options for addressing capability gaps and forms a unified integrated framework for capital expenditures, including the acquisition, integrated logistics support, decommissioning, and/or modernization of defense equipment, and infrastructure, through the implementation of investment, infrastructure, international, and other projects.

The DIP covers a ten-year period and is developed, amended, or updated during a defense review (every 4 or 2 years) or as necessary—by decision of the Minister of Defense.

The Chief of Defense, together with the Secretary of Defense, leads and is responsible for the development of the DIP.

The Armed Forces Development Plan and the Defense Investment Programme are the final products of the Capability Planning Phase and serve as the primary documents for the subsequent phases. All actions within the accompanying Project Management Process and the Programming, Budgeting, and Implementation and Reporting Phases should ensure the implementation of these two documents.

IV. · CONCLUSIONS

Capability planning is a process for the acquisition, development, or phasing out of defense capabilities in

response to changes in the security environment. This approach is fundamental to national defense. The proposed prototype methodology for conducting strategic defense describes the sequence of activities aimed at achieving adequate defense capabilities for the armed forces in peacetime. The methodology was used during the Strategic Defense Review conducted in 2019. Thus, the model was validated. The following criteria were used to validate the methodology: 1) Quality and Compliance criteria and 2) Performance Metrics

During the Strategic Defense Review, the model demonstrated stability, and the process activities were carried out within the defined parameters without significant deviations. The methodology met the predefined specifications and regulatory standards, i.e., it proved to be practically applicable. The ability to repeat the process multiple times with consistent quality results was demonstrated, which is evidence that the proposed model is reproducible.

As a result of the review, using the proposed methodology, 188 minimum required military capabilities were identified and prioritized in a list of capability gaps. After accounting for the necessary and available financial resources, these capabilities were optimized to 38. Thus, in practice, the optimal, compromise option was determined within the given financial resources, through which all formations declared in NATO's Capability Goals and initiatives can be established, as well as the critically important capabilities related to the implementation of the three main projects for the rearmament of the Armed Forces at that time. In practice, all final states has been reached.

Despite the mechanisms built into the model to prevent subjective intervention, including: regulatory clarity and predictability, detailed descriptions of procedures and activities, the creation of clear algorithms for action that leave no scope for interpretation, the establishment of principles of "bound competence", the implementation of organizational and control mechanisms, the use of digitization, specialized software, a scientific approach, etc., a lack of integrity, ethical and moral standards, the presence of political affiliations, personal preferences, or prejudices can regulate the results outside the defined framework of the methodology. However, this is characteristic of almost every complex organizational system and can hardly be sufficiently characterized as a shortcoming of the methodology.

The proposed methodological prototype yields good results in peacetime defense planning. Capability planning in wartime is the process of identifying and maintaining the military resources necessary for the effective execution of combat missions. Essentially, this type of planning must ensure flexibility and an adequate rapid response for the acquisition of defense capabilities and the transformation of defense structures. In wartime, it is logical that some of the activities described in the prototype be reduced to the following:

- Identification of critical capabilities: Focus on intelligence, combat power, air and missile defense, logistics, and cyber defense;
- Gap Analysis: Comparison between the current state and the requirements for actual combat operations;
- Mobilization readiness: Planning for the rapid deployment of human resources;
- War-time economy: Redirecting civilian industry toward military production. The goal is to strengthen defense capacity through defense products, technologies, and dual-use items.

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REFERENCES

[1] Tagarev, T. Defence and Armed Forces Planning Methodology, Available:https://procon.bg/system/files/2.1_planning_methodology_0.pdf [Accessed May 05, 2026]

[2] https://www.idef.com/idefo-function_modeling_method/

[3] Coronel, Carlos; Morris, Steven (February 4, 2014). Database Systems: Design, Implementation, & Management. Cengage Learning. pp. 695–700. ISBN 978-1285196145. Retrieved 25 November 2014.

[4] Radulov I., Modelling of Capability-Based Defence Planning Processes Print ISSN 1691-5402 Online ISSN 2256-070X Available: https://doi.org/10.17770/etr2024vol4.8214 [Accessed May 05, 2026]

[5] Guidelines for capability-based defence planning, introduced for implementation by order of the Minister of Defense № OX-323/29.03.2019.

[6] Neno Hristov, Ivo Radulov, Petko Iliev, Plamena Andreeva "Prioritization Methodology for Development of Required Operational Capabilities", "SYSTEM ANALYSIS & STUDIES PANEL", SAS-081/RSY, NATO Research and Technology Agency (RTA), 26-28 April 2010, Sofia, Bulgaria. Available: https://pdfs.semanticscholar.org/73dc/d76478a67e70d27fa3187a068fc23fa36f01.pdf [Accessed May 05, 2026]