MILITARY ENGINEERING STRUCTURES' TRANSFORMATIONS IN THE CONTEXT OF CONSTANTLY CHANGING ENVIRONMENT OF ACTION

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The need to adapt national security and defence policies to the current characteristics of the security environment is subjecting the military institution to an extensive process of transformation. From this perspective, the nature of the conflicts that characterize the XXI century requires a new approach and the development of those types of structures that can be quickly adapted to new challenges in the security environment. The main objective of the military transformation process is to create capabilities to provide state policy makers with alternatives to action in accordance with new types of risks and threats to national and / or international security. At the same time, the military transformation aims to create / gain a significant competitive advantage over potential adversaries by transforming the role of defence within national security, transforming both the defence management and the armed forces.

Keywords: battlefield; transformation; modernization; optimization; military actions; engineering support.

In the current and future environment people are faced with the challenge of addressing risks, dangers, threats and vulnerabilities, as an essential requirement on how to concentrate efficiently and optimally coordinate the efforts to effectively manage global and regional realities, in which the fluidization of state interests favorable to community interests is of paramount importance.

The diversity and complexity of the armed conflicts in recent decades in which doctrines, technologies, strategic concepts, armies with different degrees of endowment have been confronted, accompanied by a special informational and logistical support, have highlighted new situations and conditions for training and conducting military actions.

The advanced technologies that have emerged, especially in the last two decades, have radically changed the means and modalities of military actions, consequently modifying the character of the war in the future. Also, a special role in changing the character of the war has the fact that it is possible that the purposes for which the armed confrontations are triggered have been framed both in the official spectrum and in a hidden area, subtly masked, to convince the public of the need for the military solution as the last and decisive way to impose a state of normality.

General considerations regarding the modern battlefield

The characteristics of the modern battlefield have been and are constantly studied by specialists to ensure a realistic image for politico-military decision makers, but those considered to be decisive now and more importantly in the future, are "lethality, permanent environmental changes and high dynamics of fight as well as the extent of military actions"[1].

Given the rapid pace at which weapon systems and ammunition are currently evolving in order to optimize the effect on the opponent and thus increase their lethality, we can deduce that engineer protection is becoming increasingly important in today's confrontation environment.

Starting from this reality, we can highlight the decisive role that the tasks of military engineering acquire outside the contact with the enemy, especially those that contribute to the hiding of their own forces and those executed for misleading the opponent.

Permanent environmental changes and the high dynamics of combat actions permanently influence the mobility and countermobility of the

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maneuvering forces. This fact generates additional needs for specialized engineering forces capable of anticipating possible changes and allocating sufficient resources to solve specific tasks that allow own troops to perform the maneuver in good conditions and at the same time, not allow the opponent to use the ground to their advantage.

The amplitude of military actions has an influence on the engineering support as a whole because, as we know, the military engineering capabilities are limited. In very few known situations can it be said that there are sufficient engineering forces and resources to support military actions in optimal conditions. Most of the time, the scale of military actions generates engineering support needs that cannot be fully and timely covered by the existing engineering forces and technical means. In the situation when for the development of military actions capabilities are necessary that can be covered only partially by military engineering, two ways of action can be approached to support military actions.

The first way involves identifying and using human, technical and material resources from outside the defence system that can fill the range or action volume of military capabilities to fully compensate for the existing deficit. The second way of action is restrictive and allows the use of engineering capabilities only after a thorough prioritization has been made in order to solve specific tasks in the most important moments of the battle. Of course, the combined use of the two variants ensures a high success rate as it generates usage optimization of all available resources at the most important moments of the supported actions.

The current complexity of the confrontation environment forces the participants to manage the space by dividing it into zones. These areas can be categorized according to different principles and here I would like to mention:

- areas that are defined by the value / level of the combat structures – the tactical, operative or strategic levels;
- areas that are defined according to the type of action / operation and/or the chosen form of combat – the defence strip, the staging area, the base of operation;
- areas that are defined by the task / effect assumed by the combatant in the defined confrontation space – areas of responsibility, areas of interest, areas of influence.

Without claiming that this brief exposition covered the entire organization of the modern confrontational space, we could see that its dynamics, complexity and constant evolution determine the need to constantly evaluate the components of the support forces and especially the military engineering support, with a special emphasis on detachments that ensure the water bridging, ensure movement and mobility, detachments that execute mobile countermobility systems and last but not least demolitions. I consider that this ongoing evaluation is the foundation on which a coherent and efficient management of military engineering resources can be approached in support of modern military actions / operations.

Brief analysis of the courses of action that are foreseen for the realization of modern military engineer structures capable of successfully performing specific missions in the current and future confrontation environment

One of the specialists in the field of Romanian military engineering support stated in 2007 that "the realization of modern, compatible and interoperable force structures requires the fulfillment of clear and fundamental requirements and, in our opinion, these are: elaboration of a legislative framework compatible with the military system; elaboration of conceptual and doctrinal documents of the organization, endowment, preparation and use of peace forces for national security, national and collective defence, promotion of stability, as well as for the support of local authorities in situations of civil emergencies; compensation for the gradual reduction of the staff with the degree of professionalization of the military structures; increased capabilities for crisis management; simplification of command and control procedures; supporting and framing the modernization programs in the allocated resources" [2].

Based on the above, we can say that since then and until today the Romanian Army has made a remarkable effort to create a legislative framework that allows the transformation and modernization of military engineering structures at a level that ensures the successful approach of its tasks, both national defence and collective defence (NATO) and at the same time launched endowment programs on priorities in accordance with current and future

requirements predicted by specialists in the field of military engineering support.

The basic objective of the modernization process is to adjust the structure of the Romanian Armed Forces to the present and future security environment, in order to meet national commitments to the Alliance, in accordance with the processes and phenomena in NATO's transformation plan. The goal is to make the Romanian Armed Forces able to participate in the full spectrum of missions carried out by NATO and the EU.

In these circumstances, given the existence of a multinational force, it is very important that the engineering structures are able to provide adequate engineering support. The engineering structures of the Romanian Army have important tasks in these conditions. We must not forget that they were among the first structures in the Romanian Army involved in the conflicts of the last two and a half decades in theatre of operations in the Balkans, Iraq, Afghanistan or in the crises in Africa, gaining important experience.

The objective of this process for the Romanian engineering structures cannot be other than the objective established by the Alliance in this field, namely to provide engineering support to NATO forces in the whole range of missions, current and future, to give the NATO commander the greatest freedom of action at the best value for nations.

There are four medium-term directions for action to achieve this goal, as set out at Alliance level:

- increasing awareness and the capacity of engineering forces available for NATO missions;
- improving the interoperability of NATO's engineering forces;
- optimization of the command and control process in the field of military engineering;
- sustainable support for NATO forces [3].

This approach is a conceptually important change in the specific military engineering transformation. For each of these directions of action, a series of objectives have been established at the level of the Alliance, and Romania has the responsibility to establish its own objectives, in accordance with the objectives of the Alliance.

Given the continuing evolution of the engineering capabilities required to support NATO operations, starting with the *White Paper on Defence* to the *G.-1 Doctrine of Engineering Support in Joint Operations*, the structures and capabilities needed to achieve the required level of support for the anticipated missions and to support the Strategic Concept of the Alliance, we can highlight some distinct objectives for the period 2016-2025 in the development of the military engineering:

- optimizing the capability, capacity and availability of national engineering structures for NATO missions;
- throughout the Alliance, the level of understanding of the capability, capacity and availability of engineering structures available for NATO operations, must increase;
- raising the level of interoperability of NATO engineering forces;
- optimizing of the Command and Control process of engineering structures;
- contributing to the support of NATO forces.

The process of modernizing the engineering forces channels the effort of transformations towards a new modern conception of combat support through the component of *engineering support for combat.*

This process is based on *G.-1 Doctrine of engineer support in joint operations* and the *Transformation, development and endowment of the Romanian Army program until 2026 and in perspective*, documents that fully ensure the legislative framework necessary to obtain those modern engineer capabilities that they can ensure the successful fulfillment of the missions incumbent on the military engineering structures to ensure support at the highest level both in national and multinational framework together with the alliance partners.

Despite the fact that high-precision hitting systems, cyber-attacks and social media are gaining more and more weight in today's scales of confrontation, the importance of engineer protection of forces can never be ignored. Regardless of whether we are talking about preparing the national territory for defence or the missions and tasks of military engineering structures during and after conflicts and in the post-conflict period we will see that they always provide key elements that contribute substantially to the success of their own actions/operations and/or allies.

To exemplify this statement, I will refer to the opinion of one of the engineer specialists who stated the following: "Conducting misleading operations

can be influenced by technological developments, especially the development of robotics and speech processing and synthesis technologies. For example, a fleet of robotic elements will be able to simulate the maneuvering of forces or control points in parallel with deceptive actions in the electromagnetic environment (by imitating the electromagnetic signature of the PC / own units) especially in the urban environment. Advanced voice processing and synthesis technologies can effectively contribute to simulating the voice of own or enemy personnel in communications networks or radio stations"[4].

This example shows us how the efficiency of the military engineering works specific to misleading is increased, namely the typical works of the command points or those typical of the disposition of the military structures in a district, executed in volume of 1/3 of the necessary, completed with the above-mentioned measures. They cause the high-precision systems used by the opponent to lose their efficiency considerably and, implicitly, they will no longer obtain the expected effect on the targeted targets.

For modern engineering troops today, there is a tendency to develop organizational structures with a high self-protection capacity, possessing mobile command points equipped with all necessary facilities, multifunctional and modular armored equipment capable of performing maneuver in land, naval and all of which are already partly found in some of the structures in the composition of the forces that are made available to NATO.

The process of modernizing the genius forces highlights the current standards and materializes the existing orientations and perspective trends in the field within the modern armies. This permanent evolution is meant to give the forces of genius an appropriate level of performance and the possibility to operate without limitations with similar military structures of the alliance in joint actions/operations.

In order to achieve engineering structures compatible and interoperable with those of the allies, we must pay attention to the following features:

- timely adjustment of the concept of development of military engineering in permanent correlation with the evolution of the concept of land forces reform;
- maintaining a constructive attitude, open to the new and innovative ideas that can provide timely solutions with reasonable resources;
- permanent adaptation of the doctrinal framework to the needs of the troops in accordance with the general framework of the force category;
- the permanent increase of the weight of the qualitative performance factors in the quantification of the developed capacities;
- fulfilling the provisions of the reference documents in the field;
- highlighting the experience gained by implementing / generalizing efficient solutions to solve identified problems;
- maintaining the continuity and stability of the transformation processes in conditions of real certainty;
- the permanent improvement of the self-assessment capacity, as well as the control capacity of the risk factors and uncertainty;
- firmly fulfilling the requirements assumed at the politico-military level for a quick and full integration in the Euro-Atlantic standards.

In order to optimize the process of modernization of engineering structures, it is necessary to assume the following requirements:

- permanent adjustment of the structures in accordance with the mission entrusted to them and the factors that influence the confrontation environment;
- the continuous increase of the professionalization degree of the positions;
- regular evaluation of the level of professional training of the staff and taking the necessary measures to comply with the imposed standards.

According to those stated by specialists in the field, these objectives can be categorized as follows:

- "general – defining the role of a certain military engineering structure for a long period of time;
- derivatives – staggered so that their prior realization gradually leads to the achievement of general objectives;
- specific – fixed to an activity, compartment, set of compartments meant to contribute to the realization of the derivatives" [5].

We could add to this brief analysis of how issues related to the process of transforming military engineering structures are managed also a brief

reference to the importance of how engineering support missions should be grouped. It is obvious that in order to make this grouping, relevant criteria are needed and in this category the following are mentioned by the specialists in the field: the identity criterion, the convergence criterion, the rationality criterion. Each of these criteria contributes to the optimization of the actions carried out by the engineering structures and to their organization and operation in conditions of maximum efficiency.

Conclusion

All the above converge to the idea that the gradual implementation, staging and setting of objectives by areas are very important steps that must be taken responsibly in order to substantiate the new engineering structures within the budgeted financial resources.

In the same respect, in order for the transformation of engineering structures not to be made superficial, a sufficiently long period of adjustment and refinement of conceptual adaptability is required simultaneously with the technical and administrative operationalization of the structures in the new context.

It can be seen that the real development of the engineering structures can be achieved by equipping them with modern technical systems, equipment and materials that can generate a wide range of capabilities and simultaneously execute large volumes of work. The new equipment that will become part of the endowment of the engineering structures is required to be compatible and interoperable with that of the allied partners, at the same time to offer possibilities of high-level protection, and last but not least to be multifunctional.

Another basic element that must be mentioned here, that leads to the optimization of the transformation, is the gradual realization of the process of professionalization of the engineering troops.

In conclusion, we can say that NATO reference documents have been implemented in the national defence doctrine, at this time Romania being involved in a comprehensive program of endowment / modernization with NATO compatible equipment, and with the completion of this process the Romanian Army will reach full technical integration with NATO and the EU.

NOTES:

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2 Lt.col.dr. Dumitru Radu, „Consideraţii privind criteriile vizate de noile structuri de geniu, în perspectiva anilor 2015-2020", *Bulletin of "Carol I" National Defence University* no. 4/2007, "Carol I" National Defence University Publishing House, Bucharest, p. 454.

3 Mihai-Silviu Popescu, „Aspecte privind realizarea interoperabilităţii cu structurile NATO în domeniul conducerii protecţiei genistice", *Bulletin of "Carol I" National Defence University* no. 2/2007, "Carol I" National Defence University Publishing House, Bucharest, 2007, p. 85.

4 Lt.col.instr.av.drd. Stanciu Cristian-Octavian, „Comanda şi controlul acţiunilor militare în contextul integrării tehnologiilor moderne", *Bulletin of "Carol I" National Defence University* no. 2, vol. 2/2015, "Carol I" National Defence University Publishing House, Bucharest, 2015, p. 234.

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