

THE CURRENT COMMAND AND CONTROL SYSTEM OF REALIZATION OF ENGINEER SUPPORT TASKS OF TASK FORCE OPERATION

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Abstract: The article deals with the current command and control system of realization of engineer support tasks of task force operation depending on the realized steps within the Army of the Czech Republic transformation in recent years. The aim of the paper is to evaluate the current state of command and control system and identify possible causes contributing to the current situation in this area. To identify crucial causes which have a significant impact on the command and control system of realization of engineer support of operation was used so-called problem tree method.

Keywords: Command and control; System C2; Engineer support.

1 INTRODUCTION

The role of military forces in the military operation must be carefully considered and understood. With regard to difficult and unpredictable changes in the strategic environment, new ways of thinking, planning and negotiating will be required. Today's dynamic process of the growth of modern technology has a major impact on areas such as the construction and development of command and control systems. All this is happening beneath constant by changing conditions and under the influence of a number of active factors stemming from the military research carried out and the deployment of forces and resources in operations. Not only these active factors, but also other general factors, emphasize how important it is to constantly check and improve command and control systems in operations.

The field of engineer support plays an irreplaceable role in performing various military operations. In view of the requirements for effective realization of engineer support, it is necessary to continuously verify the functionality of the organization structures, the number of engineer units and the effectiveness of the command and control system in the operation.

2 OBJECTIVE AND METHODS USED

The main goal of the author is to make an analysis of the command and control system in performing the tasks of the engineer support of the task force operation and, on the basis of the findings, to propose measures that will optimize the problem.

In order to achieve the main goal of the work, the following partial objectives were set:

Goal 1: Analyze the current status of the command and control system in performing the tasks of engineer support for the task operation.

Goal 2: Formulate a key issue.

Goal 3: Define recommendations for optimizing the command and control system to perform the tasks of the engineer support task of force operation.

3 THE INITIAL DEFINITION OF THE PROBLEM

Until 1999, the Czech Army developed the capabilities to ensure the individual defense of the Czech Republic. After joining NATO, capabilities were developed in line with the needs of collective defense. After 2004, the necessary skills were strengthened for deployment in foreign operations, which has in many respects increased professional readiness and enhanced interoperability with allies. However, the military action in military operations had negative impacts, which reflected in the limitations of the training of troops, commanders and staff for the main types of combat activities. In the years 2009–2013, due to the decrease of the source framework allocated to the ACR, there was a slowdown in the transformation, which was significantly reflected in staffing and replenishment of machinery according to the number of soldiers and especially the achievement of the required capabilities of the Czech Army. Command and control systems have been unified both in terms of composition and staffing, as well as technical equipment [1].

Nevertheless, even under limited conditions, the capabilities of individual troops have been developed, notably in the unification of planning procedures and the actual execution of operations. Most attention, however, was focused on manoeuvre forces.

4 VALID DOCUMENTS DEFINING THE CURRENT STATUS OF COMMAND AND CONTROL SYSTEM OF REALIZATION OF ENGINEER SUPPORT TASKS OF TASK FORCE OPERATION

At present, we can find a wide range of documents that are partly or fully engaged in the command and control system of military operations. Doctrines provide general framework for the planning and preparation of army forces to conduct operations in peace, in crisis situations during the war. The importance of doctrines is to ensure a consistent understanding of the principles

of preparation, operations management and the achievement of an optimal level of interoperability by NATO member states. The doctrines are based on the "Security Strategy of the Czech Republic", on the "Military Strategy of the Czech Republic" and on NATO's basic military and political and operational standards. It deals with the current issues of the Czech Army concept and development and the level of contemporary military thinking and cognition. For the needs of engineers "Allied Tactical Doctrine for Military Engineering" ATP 3.2.1" is of paramount importance.

Within the Czech Army Doctrine of the Command and Control System in Operations there exists the publication of "Ground Forces in Operations" (2011), whose aim is to clarify sharing ground forces in the conduct of joint Allied operations, to clarify the way and the principles of ground operations and the way in which the Czech Army ground forces are involved in these operations [2]. In 2007, the publication of the "Staff work in operations, part I" was published, describing the authorities of the command and their main tasks, which will usually be fulfilled in the operation, command positions of the individual organizational elements of the Czech Army following the strategic command posts, their composition and tasks with the concept of command posts and the current organizational structure of the professional the Czech Armed Forces [3].

The system of command and control of engineer support in operations is not a new area, however the proper elaboration and description of this area in the documents that clearly define the required state of the Czech Army in 2025 is done only partially and mainly for strategic or operational level.

For a tactical level, the command and control system is also developed only partially, especially from the point of view of infantry units. Also, these documents are not responding to current developments and their content often does not correspond to the actual or required status according to the approved army development documents.

5 DIFFERENCES AFFECTING THE SYSTEM OF COMMAND AND CONTROL SYSTEM OF REALIZATION OF ENGINEER SUPPORT TASKS OF TASK FORCE OPERATION

Engineer support is a multi-branch activity that is carried out by all types of troops and multiplies the capabilities of troops across the whole spectrum of operations. Engineer support is a part of the combat support provided to commanders, crews and task forces troops. It includes a whole range of activities from providing engineering recommendations to the implementation of the most complex engineering measures for the benefit of troops [2].

With regard to the specific use of engineer units for combat activities the intensity of use of these units during the entire conflict is affected not only in the period before or during the conflict, but also in the post-conflict period. This effort then changes in the different phases of the operation.

Fig. 1 shows the intensity of effort of engineer units. In support of operation, the intensity of effort of engineer roles useable for general support is greatest at the beginning and end of operations. On the contrary, for the effort of engineer roles useable for combat support are intensity the highest during operation, while the total effort is constant throughout the military operation.

From the point of view of the activities of manoeuvre and engineer units, we are led by facts that are reflected in the scope and content of each period of the military decision-making process of the commander and the staff at all stages of the operation.

The following points describe the most important facts:

- The structure of the command post of the engineer battalion from the point of view of occupying positions is similar to manoeuvre units. The main difference lies in the fact that the emphasis is put on the staff members with engineer specialization. Another, no less important, difference is that engineers do not have expert of manoeuvre units. From the above, it is clear that in most cases it is not possible to create the same command post from the point of view of the structure of function position as the command post of manoeuvre units;
- Engineers have usually defined very specific tasks in the operation order, characterized by time, synergy and volume of work, including limitations. Tasks that are specifically set out clearly show the follow-up in preparation, planning and execution itself. For this reason, members of the engineer battalion perform a variant solution rather than the actual creation of options of realization of engineer support tasks in favor of all arms commanders;
- Different planning activity at the level of the brigade task force and engineer battalion. The brigade task force staff carries out the planning of engineer support tasks and the engineering battalion staff is planning realization of engineer support tasks, see Fig. 2;
- The necessity to ensure synergy between manoeuvre and engineer units in the realization of the engineer support tasks. Implementation of engineer support tasks is usually coordinated and tailored according to specific details directly at a designated location in the field - for example, location and orientation of protective structures;

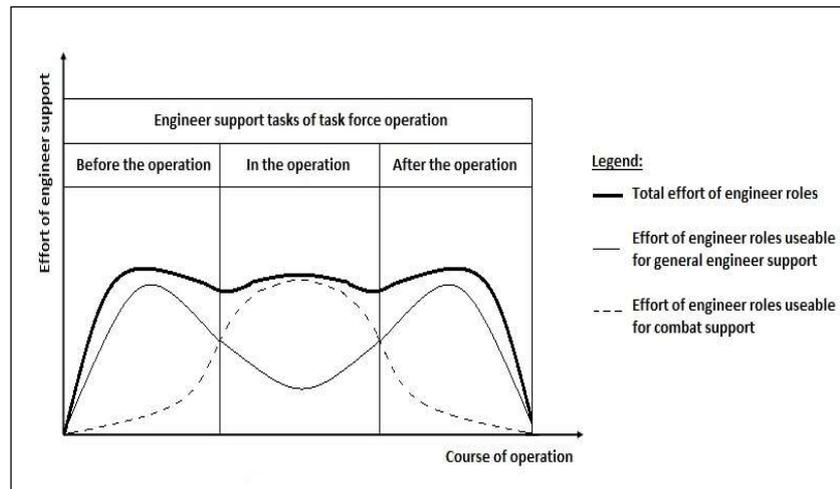


Fig. 1 Division of efforts of engineer support during the military operation
Source: [4].

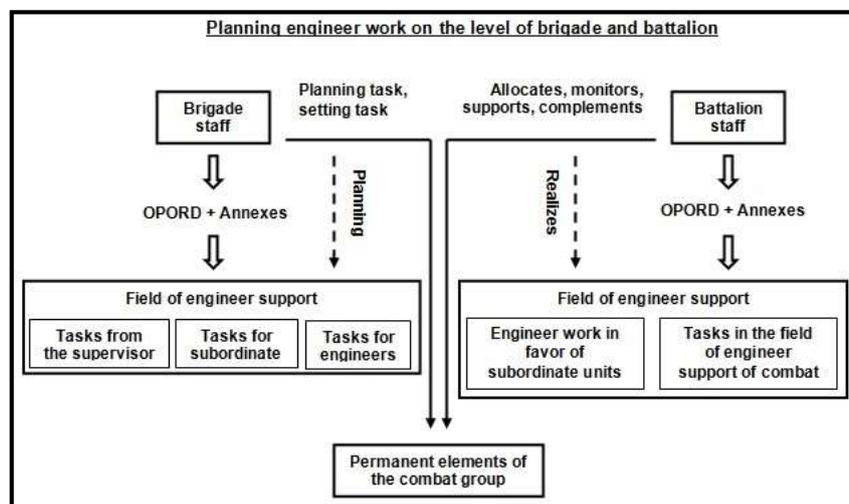


Fig. 2 Planning of the Engineer's Work
Source: author.

- The high complexity of the planning process imposed on the engineer battalion commander due to the simultaneous fulfillment of more engineer support tasks for the benefit of ground units in the operation area. The commander of engineer battalion must be able to create, manage and coordinate a variety of groups and teams in the most effective way to fulfill engineer support tasks at one moment;
- Allotment (transfer, takeover) of engineer units to the benefit of manoeuvre units. According to the established principles of warfare, one commander is usually responsible for the area of responsibility. In the case of realization of the tasks of engineer support it is necessary to transfer the units of the engineer troops to the subordination of manoeuvre commander so that he can make the best use of them for his benefit. Within the framework of engineering combat forces are created permanent and unstable

- components of the combat group. For example, between permanent components of the combat group are included a movement detachment or blocking detachment. These permanent components are usually transferred to the subordinate of the manoeuvre commander, and are controlled by the task force engineer;
- The use of engineer units resulting from their organic structures. Units of the engineer battalion are usually divided into special units according to the tasks of the engineer support in order to achieve the most efficient tasks of the engineer support. For this reason, the purposeful use of engineer troops is more effective than strict adherence to the organic structure;
- As part of a warfare, the engineer commander is usually commanding only engineer battalion members included in the engineer reserve. As described above, the commander of the engineer battalion creates from its own forces the

permanent component of the combat group. Units that are not a part of the permanent components of the combat group create engineer reserve that remains under the command of the engineer battalion commander. As a part of the warfare, the battalion commander is in charge of this engineer reserve, which is predetermined to perform unplanned or unforeseen tasks based on the development of operation. Engineer reserve also serves to strengthen or compensate for the loss of permanent components of the combat group.

6 IDENTIFYING A KEY PROBLEM USING THE "TREE OF PROBLEMS" METHOD

To identify the key issue, I used the "Tree of Problems" method, the output of which is the graphical visualization of the detected problem. The aim is to provide a comprehensive view of the problem and identify its main causes and implications [5].

6.1 Identified causes

- The creation of an ever-new state of public finances influenced by the Czech Armed Forces concept leads to the unsystematic development of the military capabilities of the Czech Army;
- Creation of engineer structures regardless of the fulfillment of obligations and needs arising from NATO standards and national requirements;
- The absence of a scientific research of the issue, where at present the issue is not solved and further developed with respect to the needs of the engineers;
- Various activities of manoeuvre units in relation to the activities of the engineer units - composition of the engineer units, the use of engineer specialists and the time-consuming requirements for planning, preparation and fulfillment of tasks;
- Obsolete technical and material equipment with regard to the financial demands of a wide range of techniques and material for the needs of engineers – inadequate response to development trends in command and control system, the necessity of introducing mutually compatible material and technical means;
- Documentation addressing the area of the system of command and control of the engineer support of the operation - general elaboration of doctrinal documents, dealing in most cases only with all deployment units. Obsolete or even unprocessed regulations within branch of engineers. Unprocessed regulations dealing with the issue of the system of command and management of the operation support;
- Low soldiers resources for military engineers - limited opportunity to gain new experience and verify current knowledge in combat

operations or at foreign workplaces, and then use them for the benefit of engineers.

6.2 Identified consequences

- Failure to meet the objective of the operation that is failure to complete the task. To successfully accomplish the task, it is necessary to maximize the capability of all the components involved in achieving the main objective of the operation, and to do so in the most optimal way;
- The non-use of the positives provided by the system of command and control of the engineer support of the operation, especially when entering the requirements for the engineer support;
- Insufficient coordination of units which are providing engineer support;
- Requirement of tasks performed by engineers not related to their task;
- Inaccurate determination of the responsibility of officers on the command post in the planning and implementation of the engineer support;
- The administrative burden placed on the command post due to the non-use of the possibilities resulting from the system of command and control of the engineer support;
- The time-consuming fulfillment of the resulting tasks arising from the requirements of commander of manoeuvre units to engineers with regard to the organization of individual workplaces and their tasks;
- The flow of information, scope and content of the processed documentation does not occur in the plan and realization of the engineer support tasks in the staff of engineer unit.

6.3 Modeling the "Tree of Problems"

The problem tree modeling and its subsequent depiction is a central problem in the trunk of a tree, when I assume that there is no command and control system of realization of engineer support tasks of task force operation and its parameters are not defined.

The overall image of the "Tree of Problems" illustrates the individual links between the causes and the central problem, as well as the central problem and the consequences. "Tree of Problems" shows a comprehensive view of the issue, see Fig. 3.

The bottom of the "Tree of Problems" shows the general causes of the problem, which are further branched into specific causes that define our central problem.

The top of the "Tree of Problems" illustrates a set of consequences that are arranged and graded from the least impact to the effects with the greatest impact.

An important root cause of the problem is the absence of an overall concept of building

a command and control system of realization of engineer support that would clearly define the different areas of developing a command and control system of realization of engineer support on a tactical level.

6.4 The following key causes need to be eliminated to remedy the problem

- Creating new concepts based on budget resources for the needs of the Czech Armed Forces - this fact affects other specific causes, which negatively affect the functioning of the command and control system of realization of engineer support;
- Engineers are not a priority type of troop – the result is the overall lack of engineers within the Czech Army with impact on the technical-material and human resources;

- Missing or insufficiently elaborated documentation dealing with the use of engineer units - it is appropriate to create a basic model of the task force of the engineers and propose an optimal variant of the command and control system of realization of engineer support;
- Lack of specialists of engineer branch with expertise – without experienced experts, conceptual documents and basic requirements for the command and control system can not be drawn up;
- Obsolete technical equipment – the need to modernize the technical equipment of the command and control system of the engineer units fully compatible with the command and control systems of the other units.

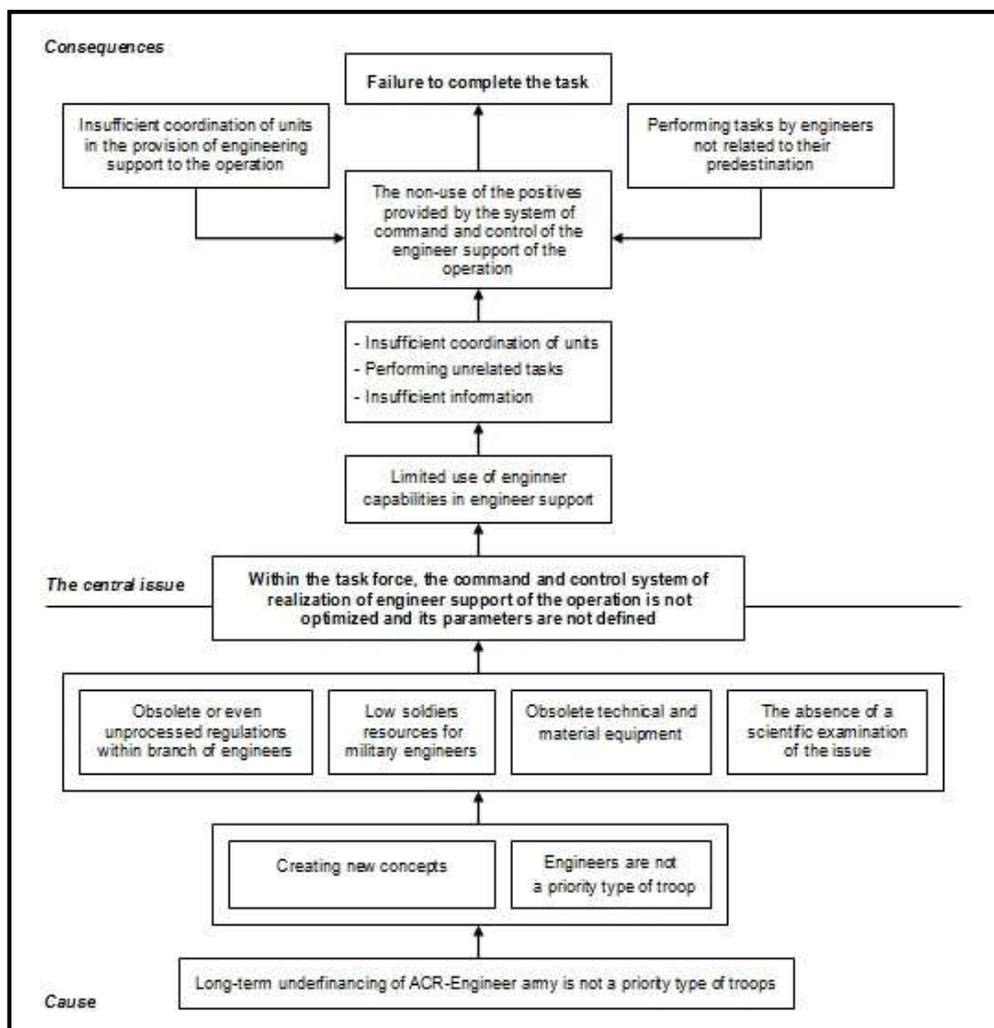


Fig. 3 Planning of the engineer's work
Source: author.

As a result of the root cause of problem, it is clear that the system of the command and control system of realization of engineer support is not optimized and its parameters are not defined. This has resulted in a major consequence, which is, in the extreme case failure to perform the operation.

Apart from the above-mentioned main result in the solution of this problem, we observe other consequences that need to be mentioned:

- Insufficient use of the command and control system of realization of engineer support outputs;
- Insufficient co-ordination between manoeuvre and engineer units in the provision of engineering support;
- Performing tasks by engineers not related to their specialization;
- Partial use of engineer capabilities in engineer support.

6.5 Problem determination

Based on the outcome of modeling the problem, the problem found in this work can be defined as follows: „Within the task force, the command and control system of realization of engineer support of the operation is not optimized and its parameters are not defined“.

From the „Tree of the Problem“ these six causes have emerged:

- Creation of new concepts of the Czech Army;
- Absence of scientific research;
- Engineer army is not a priority type of troop;
- Insufficient processing of documentation for the creation and use of engineers;
- Lack of specialists of engineer branch with expertise;
- Obsolete technical equipment.

The creation of the new concepts of the Czech Army and the absence of scientific research can be identified as key causes, which are influenced by the amount of budgetary resources allocated to the Czech Army.

7 CONCLUSION

The work is focused on determining the current state of the command and control system of realization of engineer support. This text describes the current state of the command and control system of realization of engineer support at the tactical level and defines the key issues in the field. The thesis defines the central problem.

In the next step is necessary to carry out a detailed analysis of the command and control system of realization of engineer support. To consider the requirements for the system of engineer support of operation. Subsequently,

in accordance with the concept of development, propose steps to optimize the system of command and control of engineer support.

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