

THE POSSIBILITIES OF THE IMPROVEMENT IN THE STUDY OF THE LOGISTICS OF THE ARMED FORCES OPERATIONS

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The imperative that is placed in front of modern logistic systems is aimed at achieving the ability to recognize the requirement of the users of logistic service, to shorten response time and service delivery, rationalize resource consumption and achieve greater efficiency and effectiveness.

In order to provide adequate logistics in the conduct of the Armed Forces operations, it is necessary, among other things, to have, in a sufficient extent, appropriate staff, which is created through the process of education and upbringing, by studying the right content in the right way.

The Armed Forces operations are extensive project-type jobs. They are complex in organization and technology of execution, unique, engage significant resources that are, as a rule, limited, require good coordination (homogeneous handling and coordinated action) and skillful management of resources of all kinds.

In order to provide the high quality of the Armed Forces operations, it is very important to achieve a balanced view between senior general military management (chief line manager) interested in collective quality performance and logistic experts dealing with individual specialties within the quality function.

It is also necessary that the supported system and the logistic system form a dialectical unity and act more synergistically.

General theoretical knowledge in the field of planning and management, project management, quality and teamwork are an adequate basis for improving the study and operational work on the logistics of operations.

Changes in the approach to the logistics of operations will also initiate changes in the approach to the Armed Forces operations as a whole.

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Improving the study of the logistics of the Armed Forces operations contributes to increasing their operational capabilities, as well as their ability to meet constitutional and legal obligations.

Key words: the Armed Forces operations, the logistics of operations, project management, improvement of the study of the Armed Forces operations, planning, management

Introduction

In order to fulfill their mission, the Armed Forces, as a great organizational and business-technical system, should have, inter alia, adequate logistics.

Respecting the constitutional obligation, missions and tasks of the Armed Forces, logistics in conducting the Armed Forces operations deserves special attention.

The imperative that is placed in front of modern logistic systems is aimed at achieving the ability to recognize the requirement of the users of logistic service, to shorten response time and service delivery, rationalize resource consumption and achieve greater efficiency and effectiveness.

In order to provide adequate logistics in the conduct of the Armed Forces operations, it is necessary, to have, in a sufficient extent, appropriate staff (in teaching and real system), which is created through the process of education and upbringing, by studying the right content in the right way. (Andrejić, 2000)

In essence, the Armed Forces operations are extensive project-type jobs. They are complex in organization and technology of execution, unique, engage significant resources that are, as a rule, limited, require good coordination (homogeneous handling and coordinated action) and skillful management of resources of all kinds.

For the mentioned reasons, it is necessary to know the basics of project management and the specifics of military operations, as complex and expensive projects.

In our modest logistic theory, especially in the defence system, there are not enough professional and scientific papers that deal integrally with the logistics of the Armed Forces operations. Available papers mostly partially and experientially deal with this field.

Logistics in the conduct of the Armed Forces operations is insufficiently and inadequately studied in the study programmes of the Military Academy.

The careful analysis shows a dominant empirical approach, insufficient implementation of modern scientific knowledge and approaches, methods, techniques and software, inadequate balance in the implementation of quantitative and qualitative approach to the study of the Armed Forces operations and their logistics and a pronounced lack of logistic reconnaissance (from the ground, airspace and inland waterways).

The logistics of the Armed Forces in conducting operations within the first mission, aimed at defending state (people, government, territory) from military threats, primarily from armed aggression, has to be studied more and in a different way during education and professional development of personnel in the defence system

(Military Academy and University of Defence). Different dealing with this issue is not good for the main or supporting activity (logistics) of the Armed Forces.

There is also space for improving the logistic aspects of operations (in all three missions of the Armed Forces) and for enhancing the logistics of the Armed Forces operations, especially in the field of planning and management.

The knowledge available in the system and surroundings shows that, in addition to some investment, it is necessary and possible to process the Armed Forces operations (as a whole) by using scientific knowledge (especially in the field of project management), methods, techniques, software and equipment.

Logistics in the conduct of the Armed Forces operations (and the Armed Forces operations as a whole) should be studied according to the principles and logic of systemic and situational approach, dealing with it as a special, i.e. individual case of logistics (support), conditioned by numerous specifics, and also by inherited state that has to be changed.

Combining the available results of the research on the logistics of operations in one place creates a solid starting point for improving consideration of the logistics of the Armed Forces operations.

Improving the study of the logistics of operations contributes to increasing the operational capabilities of the Armed Forces, as well as their ability to meet constitutional and legal obligations.

This paper is an attempt, through the synergy of available theory and established practice, to arouse greater interest in enhancing the study of the Armed Forces operations and the logistics of operations as an important part of the objective reality of the Armed Forces.

The characteristics of military operations

Our military practice considers operation as every target activity of our forces, which as a one-way process is directed towards the future, according to a single plan, in order to reach the goal of some level (strategic, operational or tactical). In essence, operations are complex jobs of project nature that have all the characteristics of other jobs of project type, are complex in organization and technology of execution, unique and involve significant resources that are, as a rule, limited. As project-type jobs, they are characterized by spatial, temporal and organizational-technological dimension.

When studying the Armed Forces operations, their preparation and execution, it is necessary to have a comprehensive approach and respect for the concepts, approaches and experiences of other states and armies, in order to make comparison and conclusions by analogy.

Moreover, the broader context in which the Armed Forces operations are conducted is very important: due to the aggression against our country within global confrontation - armed conflict, due to the aggression against our country with a radical or limited goal (example: the occupation of Kosovo and Metohija).

The conduct of the Armed Forces operations is influenced by numerous factors, mainly the period of war (initial period, middle period, the end of war ...), a type of armed struggle, force ratio, the place of conduct (on the front, in the occupied territory, a part - the battlefield depth...), the object of action, the main forces performing it (Army, Air Force and Air Defence, 72nd Special Operations Brigade, 63rd Parachute Brigade), the degree of surprise, the degree of mobilization, the degree of the established contact of the main forces with the enemy, time in all modalities, land - space in all modalities, the mode of action of the enemy and the type of weapons he uses, the actions of our forces ... (Andrejić, Milenkov, 2018)

The operations conducted by the Armed Forces differ in importance, the scope of involved resources, complexity, used technical systems, duration, natural environmental conditions in which they are executed, the type and size of units and other entities engaged in operations, the size of space in which they take place, the level of combining forces, etc. Furthermore, the conditions in which certain operations of the Armed Forces can be prepared and conducted are different. The operations are carried out within all three missions of the Armed Forces.

In relation to situation in country, operations can be conducted in peace, in a state of emergency and in war, and in relation to the war period - in the initial period of war, during war and at the end of the war period. (Andrejić, Čabarkapa, 2001)

Operations are carried out on the front, occupied (temporarily occupied) territory and in the rear, at the centre of combat operations within the battlefield, on the auxiliary route, by engaging forces conducting operation in the first or second echelon. In the task execution zone, operation is conducted in stages, spatially and temporally, in order to ensure continuity. The focus is expressed by the distribution and grouping of forces, and during the execution of tasks it moves.

The operations of the Serbian Armed Forces in peace include various types of activities in cooperation and cooperative engagement with other elements of the defence system of the Republic of Serbia, as well as the forces of partners, allies and friendly states.

According to the types of challenges, risks and security threats, the Serbian Armed Forces can be engaged in peace by conducting preventive disposition operations, anti-terrorist operations, counter-insurgency operations, operations in case of natural disasters and catastrophes and peace operations. In some operations, the Armed Forces are the main holder (of actions) while in some other they provide support to other forces.

The engagement of the Armed Forces in war includes preparation, organization and conduct of combat operations. Combat operations involve the way of preparing, organizing and engaging forces in combat, according to a single plan, in some space and for certain time, in cooperation with other elements of the defence system, partners and forces of other friendly countries, in order to achieve the set goal.

According to the criterion of the type of combat operations, they can be offensive and defensive, and according to the criterion of the service type of forces they can be the Army operations, the Air Force and Air Defence operations, joint forces operations and river units operations.

Moreover, having in mind the predominant content, operations can be combat and non-combat. From the organizational point of view, operations as a complex project have three characteristic time (stages) phases (Slavković, Šipka, Jukić, 2018):

- 1) the preparation phase;
- 2) the execution phase;
- 3) the stabilization and forces disengagement phase.

These phases last differently and, in principle, the preparation lasts longer than the execution, which is in accordance with the scientific principles of modern work organization.

For some operations carried out in accordance with the country's initial defence plans, the preparation phase lasts much longer than the execution phase. These phases of operation are at the same time the phases of logistic support to operations.

For the success of operation, it is necessary to carry out its preparation and execution in a high-quality manner, according to its objective, place, time, space and manner, which includes the high-quality logistic support for the preparation and execution of operations.

The preparation of operation is conditioned by specific conditions: strategic and operational situation, the territory in which operation is conducted, the time in all modalities of appearance and the position of the main forces that will participate in operation.

In principle, it includes the decision-making of the competent body for the preparation and execution of operation, planning of operation (drafting the concept - scenario of operation, plan development, plan revision, adoption and approval of plan), the organization of cooperative engagement and cooperation, taking and preparing operation area (bringing forces, development and emplacement of defence positions), the organization and coordination of combat operations and fire systems, the organization of security and support, the preparation of units and the organization of command and communication (the development and arrangement of command posts and the organization of communication...).

In the preparation phase, planning is very important because high-quality planning rationalizes numerous requirements in occurrence and prevents many unwanted consequences during operation.

The execution of operation is conditioned by numerous factors: the objective and idea for the execution, the manner (modalities) of the opponent's action, combat systems available to the opponent, the characteristics of defence area, condition (quantity and quality) of resources and logistic capabilities of the unit conducting operation.

It includes the execution of the content of combat actions, the content of providing combat actions and support, the content of command and non-combat activities in the function of the successful execution of operation.

The execution of defensive operation includes the following phases:

- conducting defence on the front part of the area,
- conducting defence in the depth of defence area,
- the preparation and execution of counter-attack.

The execution of offensive operation includes:

- performing an attack on the front part of the opponent's area,
- performing attacks along the depth of the opponent's defence area,
- the exploitation of the results achieved by an attack, consolidation on the reached line, the establishment of control over the situation in conquered area.

The stabilization and forces disengagement phase includes activities aimed at increasing the usefulness of the consequences of victory (achieved results), the organizational, material, informational, energy, moral and psychological stabilization of the situation in the unit that has conducted operation and planned and organized disengagement of forces to the required extent, in constant readiness for future assignments.

In general, operations, regardless of their type, are characterized by spatial, temporal and organizational-technological dimension, i.e. aspect. The dimensions of the area in which operation is executed depend on the engaged forces of the opponent, the type of operation (area of operation), the scope and structure of the forces and equipment that is used.

Operation is planned and executed in two to three stages and lasts from several days to a few weeks. The pace of execution and duration of operation depend on general strategic and operational situation, force ratio, capabilities of our forces operating in the enemy's formation, manoeuvre form, logistic capabilities, etc. (Andrejić, Sokolović, Tumanov, Janković, 2010)

The prolongation of operation can cause some operational crises due to the disturbed force ratio, difficult cooperation, difficult supply of material resources and other combat needs, surprises, etc. Therefore, we should try to carry out operation in the shortest possible time, which can only be done with the high-quality logistic support in the preparation and execution of operation.

The organization and technology of the preparation and execution of operations and actions of the enemy affect the dynamics of the consumption of material resources and the occurrence of losses in personnel and material resources, and thus dictate the dynamics of the engagement of logistic bodies and units supporting operation.

Operational logistic planning

The high-quality planning of logistic support to operations implies some complementarity of planning as a whole and adequate implementation of logistic planning of operations and logistic aspects of planning operations (Table 1).

The high-quality planning implies a scientific approach and implementation of numerous techniques, methods, software and equipment. Planning has to provide an operationally oriented concept of logistic support to operations.

Considered from an operational perspective, the following logistic principles can serve as a guide for analytical thinking and careful logistic planning: responsibility, simplicity, flexibility, economy, accessibility, sustainability and survival.

Force commanders have to ensure that their plans fully integrate operational and logistic capabilities and are responsible for ensuring that the overall resource plan supports the concept of operations.

The integration of operational planners and logistic planners is necessary during the planning and execution phase, and command interests, at all levels, are essen-

tial to it. An important concept in logistic planning is operational range, at a distance at which the military can concentrate and use it decisively.

Logistic planners have to anticipate possible congestion and look for solutions to bottlenecks. Proper logistic planning will reduce the need for urgent measures and logistic improvisation, which are usually expensive and often have a negative impact on subordinate and neighbouring commands.

Operational logistic planning includes:

- the objectives of commander;
- the proposed plan for the engagement and action of combat forces, based on the assessment of the situation (enemy) and capabilities;
- definition of general logistic requirements and which of them are decisive or critical;
- definition of available quantities of critical material resources (lethal weapons, propulsion resources, energy sources, medical supplies, quartermaster's material resources);
- assessment of the consequences of insufficient quantities (scarcity) of material resources for designed variants of action;
- determining what can be done logistically and tactically in order to alleviate this shortage or overcome the difficulties that have arisen;
- development of documents.

The planning of logistic support for the engagement of the Serbian Armed Forces in conducting operations should unite total resources (organizational, human, material and technical) and achieve optimal synergistic effect.

The high-quality planning of logistic support for the engagement of the Serbian Armed Forces in conducting operations implies the following logistic philosophical and conceptual orientation (Andrejić, Milenkov, Panić, Mirčevski, 2015):

- focus on the life cycle of objective reality, i.e. phenomenon,
- flow orientation,
- service orientation.

Planning logistic support for the engagement of the Serbian Armed Forces in conducting operations implies certain preconditions:

- respect for logistic sustainability of operations (logistic aspects of planning operations);
- respect for temporal and spatial (ambient) conditions in which operation takes place;
- correct identification of operational factors (objectives, forces, space, time, information);
- respect for the organization and technology of operations as complex projects;
- respect for standards, criteria, normative documents and norms of material and financial character related to echeloning, performance of work and provision of services;
- existence of adequate standardization units;

- knowledge of the quantitative and qualitative condition of logistic support facilities (people, material resources, facilities, plants, installations and engaged organizational units);
- defined level of stress of generated forces.

Table 1 – *The logistic aspects of operational planning*

| 1 | Logistics as a commanding function | | | | |
|--|---|---|---|--------------------------------|---|
| | Capability of general (broad) professional evaluation | | | | |
| | Logistic aspects of calculated risk | | | | |
| | Logistic feasibility | | | Technical aspects of logistics | |
| | 2 | 3 | 4 | 5 | 6 |
| 1. DEVELOPMENT AND PROVISION OF THE MAIN PLANNING CONCEPT | COMMANDER | | | | |
| 2. DEFINITION OF LOGISTIC REQUIREMENTS ON THE BASIS OF THE ASSESSMENT OF ENGAGED FORCES AND SPECIAL MANOEUVRE PLANS (INITIAL DEFINITION OF REQUIREMENTS) | COMMANDER logistic section of staff (ls), planning and operational section of staff (ops), plus intelligence section (ints) | | | | |
| a) Technical planning procedure (1) Use of forms and standard procedures | | | | ls | |
| b) Planning factors | | | | ls | |
| (1) Main data for use (general average) | | | | ls | |
| (2) Initial corrections of main data for use, in accordance with the existing experience in the field | | | | ls | |
| v) Operational changes to planning factors and data usage | Commander, ls, ops | | | | |
| (1) Influence of factors: time, space and atmospheric phenomena (weather) | Commander, ls, ops | | | | |
| (2) Influence of enemy's capabilities and weaknesses (integration of opinions of logisticians and operatives) | Commander, ls, ops | | | | |
| g) The identification of critical material resources is briefly presented. Postponement of consideration of non-critical material resources | Commander, ls, ops | | | | |

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|--------------------|---|---|---|---|
| 3. DEFINITION OF AVAILABLE STOCKS OF CRITICAL MATERIAL RESOURCES (PROCUREMENT AND DISTRIBUTION) | Commander, Is | | | | |
| a) Statistics and report | Commander, Is | | | | |
| b) Influence of time and space | Commander, Is | | | | |
| v) Influence of enemy's capabilities and weaknesses | Commander, Is | | | | |
| 4. ASSESSMENT OF IMPACT OF LACK OF MATERIAL RESOURCES | Commander, Is, ops | | | | |
| a) Limitations in strategic and tactical plans, i.e. the degree of freedom of action | Commander, Is, ops | | | | |
| b) Changes in strategic and tactical plans in terms of time and scope of action | Commander, Is, ops | | | | |
| v) Suggestions | Is, ops | | | | |
| 5. DECISIONS | Commander | | | | |
| a) Plan implementation | Commander | | | | |
| b) Plan modification | Commander | | | | |
| v) Plan abandonment and elaboration of a new one | Commander | | | | |

Accordingly, the Armed Forces operations, as complex projects, involve several interdependent phases that contribute to achieving the ultimate goal: the preparation of operation, the execution of operation and the stabilization of situation and disengagement of forces. In each of these phases, adequate logistic support should be provided to the engaged resources and units.

Logistic requirements in operation arise due to:

- personnel engagement;
- engagement, expenditure and provision of material resources (different classes);
- need to provide some services and
- consequences of operation (remediation of the dead, injured; demolished buildings and their remediation; destroyed and damaged resources and their remediation; degraded environment and the danger to living world).

The planning of logistic support to operations is influenced by some organizational and technological constraints.

a) The organizational constraints are (Andrejić, Milenkov, 2017):

- the commander's decision (entered into the operational plan - order) of the forces conducting operation (especially the dynamics of the execution of task, the area of forces engagement);
- appendix for logistic support with the operational plan of the superior command;
- plan (order) for logistic support of the superior command (as an appendix to the operational plan of the superior command);
- requirements, according to logistics, of the command bodies that are holders of some functions;

- approved expenditures of combat needs (by types, structure, place and time);
- estimated (expected) losses and damages (by types, structure, place and time of occurrence) of material resources;
- estimated (expected) losses and diseases (by types, structure, place and time of occurrence) of personnel;
- scope and structure of civil resources made available;
- scope and structure of resources allocated by the superior command;
- condition of logistic resources and possibilities of logistic units - theoretical and real;
- conclusions from the situation assessment according to logistic support;
- norms that regulate the work of commands and staffs and planning.

b) Technological constraints are the technology of conducting operation, which is a way of performing tasks within a certain type of operation with the engagement of forces and resources according to the defined (generally accepted) technology.

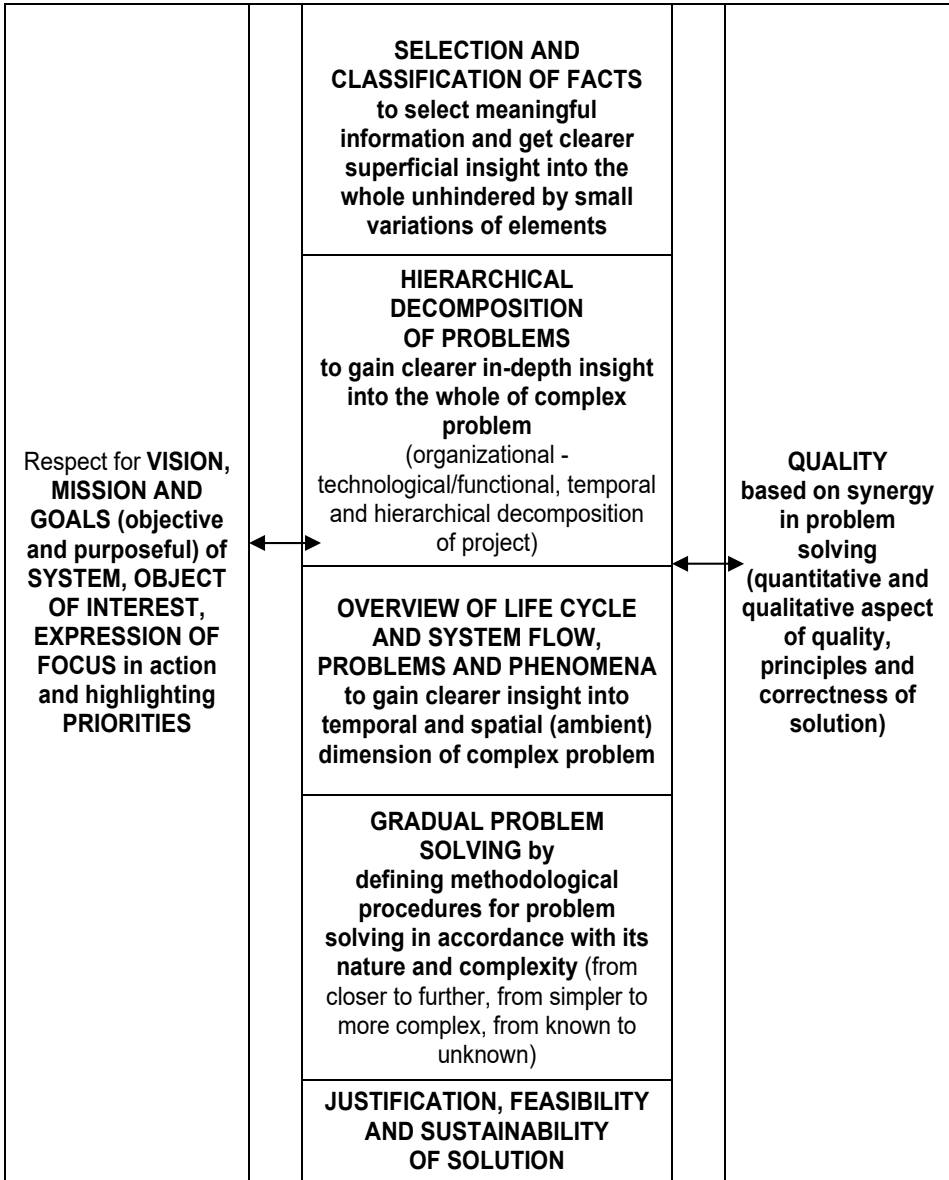
The whole system of planning logistic support for the upcoming task is based on the following order (Đukić, 2018):

- the commander's objectives;
- proposed plan for the engagement and action of forces, based on the assessment of situation (enemy) and capabilities;
- defining general logistic requirements and which of them are decisive or critical;
- definition of available quantities of critical material resources (lethal weapons, propulsion resources, energy sources, medical supplies, quartermaster's material resources);
- assessment of the consequences of insufficient quantities (scarcity) of material resources for designed variants of action;
- determining what can be done logistically and tactically in order to alleviate this shortage or overcome the difficulties that have arisen;
- development of documents.

The planning of logistic support to operations is done by stages of operation, and its contents include:

- tasks - activities related to the logistic support of operations and the engagement of bodies and units of logistics. Tasks are identified, logic interdependence of activities is defined and the flow of output parameters of previous activity into input parameters for subsequent activities is defined;
- resources (of interest for logistic support of operation);
- deadlines (beginning, end, duration) for the execution of task;
- costs.

In order to carry out the activities of logistic processes according to the required technology and to manage them in the operation execution phase, it is necessary to think of (design) operation in the planning process, implementing an adequate concept of its design (Figure 1), as well as to consider and provide all necessary input and output parameters of organizational activities.



When designing operations, in addition to other methods and techniques for organizational - technological - functional, temporal and hierarchical decomposition of project, it is desirable to use the WBS method.

The logistic support to conducting operations

In order to conduct operation in a planned and organized manner, it is necessary to have adequate logistic support. The improvement of logistic system during operations leads to the expansion of operational scope and the sustainability of forces.

The potential power of logistics in conducting operations is manifested in its action as a multiplier of force (increases battle force), in deterrence, in increasing the sustainability of forces and flexibility.

The logistic support to operations is a special case of logistic support (in general) appropriate to the mission within which operation is conducted, that is, an individual case of logistic support appropriate to specific situation. It is carried out by performing logistic tasks within logistic functions, in accordance with the defined competencies.

The logistic tasks for the needs of operations are planned and organized by logistic bodies of the Armed Forces, and are performed by logistic personnel and logistic units of the Armed Forces, other personnel and units of the Armed Forces, as well as certain entities out of the Armed Forces, in accordance with some laws and principles.

The logistic support to operations is organized by levels, in accordance with the hierarchical levels of the organization of the Armed Forces and respecting the specific services of the forces (the organization and technology of engagement).

Logistics supporting operation is required to provide manoeuvre (movement) of forces, precise action (fire), adequate protection of personnel from adverse environmental actions and rational and focused support, „top to bottom“, when necessary, where needed, to the extent in which it is necessary and in the required manner, as close as possible to the place of logistic requirements.

The intensity of the engagement of logistic bodies is influenced by the volume and structure of losses and expenditures of resources, by place, dynamics and time, and the place of the task execution: type and specifics of logistic clients waiting for service, characteristics and the place of logistic requirements.

The preparation of resources in the territory, echeloning of war material reserves and logistic resources is carried out in peace, at strategic level. Logistics management at operational command level is decentralized by making necessary resources that are performing operation during the task execution available to force commander. In order that immediate users are able to fight and complete a task, the command has to be capable of integrating logistic concepts with operational plans.

Logistic plans have to be an integral part of operational plan; limited logistic resources are allocated to provide the task execution according to given priorities. The planning and execution of logistic support to units in operation are its most important processes. Given the respective possibilities of action of potential aggressors from a distance, in the preparation for operation, there may be requests for the re-settlement of a part of war material reserves, dispersion and relocation of resources that are important for logistic support.

The dynamic change in the environmental state during actions of units in operation results in requirements for the task execution within logistic functions: supply, maintenance, health, transport, general logistics, infrastructure, which are of a stochastic character.

Firing and moving, units consume energy resources (lethal, propulsion, electric power) and technical material resources. The enemy inflicts losses in personnel and resources by its actions, which also creates logistic requirements. Time in all dimensions influences the occurrence of requirements for logistic support to units that perform operations in their zones - regions (space).

Bringing units from expected regions to zones - regions of engagement has the consequence, among other things, in higher consumption of fuel and other resources, the occurrence of exploitation failure on equipment, i.e. the submission of requests for maintenance of equipment.

The enemy actions from a distance provoke direct requests for logistic support due to the effects on target and indirect requirements due to the actions of units on cruise missiles and other targets.

The greatest demands for logistic support occur when units are directly engaged in combat actions. Research shows that the daily consumption of energy during operation is expressed in mass - from one to several thousand tons. The number of damaged pieces of equipment for light, medium and general overhaul ranges from a few hundred to over a thousand pieces per day, depending on the number of engaged forces. Logistic bodies and resources of the units engaged in operation and bodies („operational“ and „a logistic“ part) and logistic resources of the superior commands are engaged to solve the tasks of logistic support in operation.

The management logistic bodies are integrated into all commands from battalion level onwards, according to the structure appropriate to the purpose and tasks of units. (Andrejić, Milenkov, 2016)

All fighting units, from battalion onwards, also include a logistic unit. Their formation is suitable for the tasks they perform in the characteristic conditions of combat actions.

The Central Logistic Base has the necessary material reserves and resources for maintenance, transport and handling, which are spatially distributed in accordance with plans, i.e. in the specific situation according to the decision of the responsible command and can provide great support to the engaged forces.

Initial operational plans are developed in peace and updated in compliance with changes in the environment and the conclusions of comprehensive assessments. Assessments contain elements of forecasting, which are based on the implementation of scientific methods, and in accordance with them, requirements are undertaken for adequate logistic preparation.

The plans for resettlement, dispersion and relocation of resources are also updated and measures are undertaken in compliance with situation. In that sense, the preparation of territorial resources is of great importance, as well as the training of the reserve personnel of logistic bodies and units.

During the preparation and execution of operation, the management logistic bodies perform tasks in a similar way, with appropriate differences in the level and scope of work at different command levels. Information technology, pre-created database important for logistic support and up-to-date initial plans are determinants without which it would be very difficult to plan, organize and execute logistic support tasks in operations in modern conditions of performing actions.

In order to enable the subordinate units commands to work on the organization and execution of the logistic support tasks during operation, the management logistic bodies in the preparation of operation provide the necessary and sufficient set of information.

The main documents - holders of this information are the point on logistic support in operational plan, appendix on logistic support with an operational order and a plan (order) for logistic support, which are delivered to units in a timely manner.

In addition, it is useful to develop orders (plans) for the execution of tasks within some logistic functions (supply, maintenance, health, transport, general logistics, infrastructure). (Andrejić, Milenkov, Sokolović, 2010)

All subordinate commands have to be informed about the schedule (spatial and temporal) of the command and units of logistic battalion, the Central Logistic Base, civil overhaul resources engaged in operation, etc. Information on the respective resources that units rely on is particularly necessary, according to the stages of operation. Every change that occurs due to the environment action implies the obligation of the management logistic body to pass on information about it in a timely manner to the unit commands. The information on the distribution of the Central Logistic Base's resources and civil resources in the territory important for logistic support, on making them available and subordination to the subordinate units commands shall be provided in a timely manner.

If operations are executed in multinational environment, within NATO, the following logistic support options are possible:

- national logistics;
- National Support Elements (NSE);
- Host Nation Support (HNS);
- resources in Joint Operations Area (JOA);
- Mutual Support Agreements (MCA);
- Lead Nation (LN);
- Role Specialist Nation (RCN);
- Multinational Integrated Logistic Units and Multinational Integrated Medical Units (MIMUs);
- Third Party Logistic Support Services (TPLSS).

In general, logistic support to operations includes problem-solving appropriate to the current situation, available opportunities, environmental conditions and the mission that operation is conducted within.

When performing tasks, achieving results and goals in the area of operation, logistics is guided by the following principles:

- shorten response time,
- reduce logistic track (unmasking activities and movements) and
- reduce logistic infrastructure and facilities.

Logistic support operations management

A high level of quality of logistic services is expected from logistics - during the preparation and execution of operation and during the forces stabilization and disengagement.

The high-quality preparation and basis for logistic support operations management are logistic support plans and information on deadlines, resources, costs and quality of execution of logistic support tasks.

Modern software based on the implementation of Gantt charts and methods of network planning and management (NPM) enable high-quality planning, monitoring (Diagram 1), management and analysis of operations and their support.

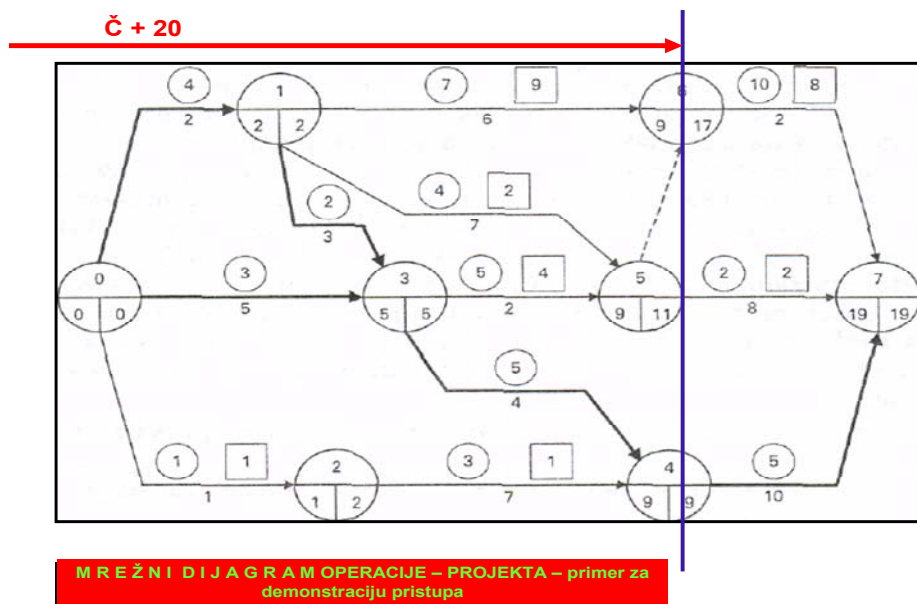


Diagram 1 – *The graphical presentation of the network plan to visualize the benefits of its implementation*

This software enables various types of analysis: sensitivity analysis, goal achievement analysis and „what-if“ analysis and enables instant insight into the level of a task (activity),

i.e. shows whether an activity is late, whether there are reserves for its execution, how it affects subsequent activities and tasks and the entire operational project.

Management problems related to operational projects (with the dominant participation of the Armed Forces) do not arise from the organizational, but from the process structure due to unrelated activities of the processes (especially in the sphere of material resources) or the processes. (Bogdanović, Hadžić, 2019)

In order that the activities of logistic processes take place according to the required technology and be managed, all the necessary input and output parameters of organizational activities have to be identified and provided during the planning process. (Ćemalović, 2016; Mićović, Miletić, 2019)

Moreover, it is necessary to know the person to submit outgoing structural information, outgoing material flows and reports, i.e. it is necessary to perform horizontal and vertical informing.

Programme information directs the executors of activities to perform activities at the time and in the manner defined in the tools (for example, network plan combined with Gantt chart and decision tables, technological instructions ...) to determine the technology of execution.

Structural information provides all instructions, i.e. documentation basis for the high-quality physical performance of tasks within the activity (reminders and instructions for performing tasks).

Input material flow directly affects the physical performance of an activity, which achieves the result in the form of output material flow of activity. Control information enables obtaining the actual and current state of performance of activities based on comparison with programme information. Output structural information, from the previous activity, partially or completely passes to the following activities.

Output material flow that arises as a result of an activity, partially or completely, passes to the following activities, provided that output material flow from an activity can be structural information for the following activity.

The technology of implementing organizational processes is not only based on defining the logical interdependence of activities, but also on defining the flow of input parameters of the previous activity to the input parameters for subsequent activities. (Milojević, Mihajlović, 2019)

In order to carry out activities, it is necessary to have programme information and know input material flow. Furthermore, in order to enable the task executors to conduct activities, it is necessary for them to have all programme information, input structural information and secured input material flow. (Rakić, Adamović, 2019)

Moreover, it is necessary for them to know the person they should submit output structural information, output material flows and reports.

Three ways of transfer are possible (Andrejić, Pamučar, Đorović, 2011):

– the previous activity executor, according to pre-specified obligation, transfers his output parameters to the following activities executors;

– the following activity executor, according to pre-specified obligation, performs the transfer of output parameters and results of the activity from the previous activity executor;

– the previous activity executor, according to pre-specified obligation, transfers his output parameters to the (project) management, and it further transfers them to the following activities executors.

Activities are performed by individuals, groups, technological units, teams and units that are organizationally, through their management, connected to some organizational units. In order that each organizational unit or individual - executor can carry out certain activities, they need data and information. Also, the management that manages the complete organizational process needs some information that is provided through horizontal and vertical informing. (Jolović, Bobera, 2019)

Horizontal informing is conducted between the activity executors of the same level, which transfers output parameters and results of previous activities to the following – subsequent activities. On the other hand, vertical informing implies the transfer of information from direct executors (individuals and teams) to managers at all levels, including the body that is the most responsible for the planned execution of activities.

In order to successfully manage the execution of logistic support to operations, it is necessary, based on the programme (organization and technology) of execution, to provide all necessary information on planned activities so that one can order - activate their execution (programme information) and during the control of activities execution get projected output parameters and results of activities that can be compared to input parameters.

Successful logistic support to operations requires ensuring the transfer of all parameters and results of previous to subsequent activities. If during the execution there is a later or earlier end of the activity, it is necessary to make a decision on the further course of their conduct and the change that has to be carried out (for example, shortening the activity on a critical path or the earlier start of an activity), i.e. to change programme information, then conduct vertical and horizontal informing.

The resources for logistic support to operations are limited, so it is necessary to solve the problem of their optimal distribution and to set the information basis for their provision in accordance with quantity, quality and deadlines. The essence of the optimal distribution of limited resources, in the function of time, for the execution of any activity is projected on defining the start time of each activity, which, with given limited resources, provides the task execution in the shortest time, taking into account technological dependence. The optimal solution for resource engagement is conditioned by the adopted optimization criterion and present limitations (limiting conditions), and can be done by respecting the following criteria: to think of an optimal resource engagement plan (including commanding forces, execution forces and operation protection forces), following strict deadline, with the known scope and type of tasks; to define the minimal duration of task for strictly assigned resources, the known scope and type of tasks; to define the type and scope of tasks that can be

executed while achieving maximal effects (economic and other) for the known available resources in a given time interval.

The command that manages operation has to provide the required quality, i.e. the effectiveness and efficiency of its execution (everything has both value and price), which requires the implementation of both traditional and modern way of considering the organization performing operation.

In a traditional way, organizations are considered through a vertical dimension - insight into their organizational scheme, which provides insight into the effectiveness of an organization, i.e. whether it does the right thing or, in other words, whether the management has made the right decisions about what to do.

However, organizations are systems that consist of processes converting certain inputs into outputs. Results are achieved (or not achieved) horizontally, not hierarchically. Therefore, every organization, in addition to a vertical, has also to pay attention to a horizontal dimension; what it does it has to do it in the right way - efficiently. Thus, every decision to conduct operation made by the management (responsible person, body) and each operation conducted by subordinates has a positive or negative effect on quality. Therefore, in order to carry out certain tasks, achieve results and goals with the required quality (effectiveness and efficiency), the organization (personnel planning and conducting operation) should have a good understanding of the impact of the whole system on quality.

Possible discontinuities in the organization structure between different levels of management and different functions weaken its structure, creating isolated operational islands. The opportunities for improving the business of organizations are between these operational islands and are reflected, primarily, in establishing better communication between them.

Therefore, the quality of the preparation and execution of the Armed Forces operations should be considered at three levels; (I) strategic, (II) process and (III) at the level of operations.

At the highest, strategic level, the quality care consists of efforts to meet the requirements of „external users“.

At the process level (middle management), organizational units are established as functions or sectors, such as public relations (marketing), development, design, production, procurement, finance, etc. Since most processes are interdependent, there is a danger that managers of individual sectors, in an effort to improve the business of their unit, will cause some damage to the business of the organization as a whole.

At the operational level, output standards have to be based on requirements defined at the strategic and process level. These standards include requirements such as accuracy, precision, completeness, compliance with deadlines and costs.

In order to provide the required quality (effectiveness and efficiency), different parts of the organization's management system can be well integrated using common elements. This can facilitate planning, resource distribution, definition of complementary goals and assessment of the organization's overall effectiveness.

The integration process can be defined as an effort to achieve harmony of „individual“ management systems (Simić, Teuta, Yang 2019), in order to achieve the goals of the system that deals with operations. Integrated systems then represent „a system of a system“ in which individual systems lose their independence, retaining their identity. Integration is conditioned by the need to achieve unity and synergy of action, to avoid opposing actions and influences on the system, and can be horizontal and vertical.

Vertical integration takes place through the decomposition of the goals of “the business“ system. The coherence of goals is the basis for synergistic effects in the execution, e.g. quality goals fit into the existing goals of an organization, are compatible, contribute to their execution and have no opposing effects.

Horizontal integration of management systems is based on business processes.

Each of the specialized functions is responsible for its scope of work. However, in addition to that, each of them has to take an appropriate share in the functions that „stretch“ throughout the entire organization that deals with the Armed Forces operations (human resources, information system, finances and, of course, quality). Combined activities, functional, cross-functional and at organizational level result in the operational quality.

It is very important to be aware of the difference in views on the operational quality (effectiveness and efficiency) by top management and holders of some functions (specialists). Senior management is primarily interested in total quality performance, while specialists deal with specialties within the quality function, so it is necessary to establish the required balance by wise action.

Conclusion

The planning of the Armed Forces operations has to provide an operationally oriented concept of logistic support. Force commanders in operations have to ensure that their plans fully integrate operational and logistic capabilities and are responsible for ensuring that the overall resource plan supports the concept of operations.

The integration of operational and logistic planners is necessary during the planning and execution phase, and command interests at all levels are essential for it. Proper logistic planning will reduce the need for urgent measures and logistic improvisations, which are usually expensive and often negatively affect subordinate and neighbouring commands.

The potential power of logistics in performing operations is reflected in its action as a force multiplier (increases battle force) in deterrence, in increasing the endurance of forces and flexibility.

In order to improve consideration and operational action in studying the logistics of the Armed Forces operations, it is necessary to respect the need of dialectical unity of logistic theory and practice, the unity of supporting system and system that renders support, the knowledge of logistic past (heritage, tradition), understand the

present and predict the future. The approach to enhancing situation, thinking and acting should be multidimensional, due to the analogy and well-known mutual assistance of scientific disciplines, the possible synergy of theory and practice.

In the search for improvement, a proactive preventive approach should be implemented, undesirable requirements in occurrence should be constantly rationalized and causes should be addressed, not consequences.

The Armed Forces fulfill their constitutional mission and legal obligation by performing operations with high-quality, especially within the first mission.

There is no high-quality execution of operations without logistics. The high-quality execution of operations is achieved by the synergy of efforts of all subjects of the hierarchical system that have been assigned the task of performing operation and numerous stakeholders. The high-quality execution of the Armed Forces operations requires the knowledge and respect for organization and technology of work in the field of operations and great visualization of the process of interest for those operations.

In essence, the Armed Forces operations, especially operations within the first mission aimed at defending state (nation, government, territory) from armed aggression, are extensive project-type jobs, and the theoretical basis for their planning and management is „project management“.

In the process of training personnel (at the University of Defence) for work related to the Armed Forces operations (preparation, execution, stabilization and disengagement, analysis) it is necessary to consider stages - phases, aspects, dimensions, according to the principles and logic of systemic and situational approach (elements, functions, processes).

General environmental conditions (political, legal, economic, military) greatly affect operations and their logistics, so it is necessary to train personnel according to high-quality models based on high-quality scenarios.

The system that supports and the supporting system should form a dialectical unity and act more synergistically. Both core business (the system that supports) and the supporting business (logistic system) need to be further developed and continuously studied on a scientific basis. It means that holders of main activities and management should be educated more in the field of support (logistics), and holders of logistics in the field of planning, organization and technology of operations and operations management, taking into account the known relationship between price, speed and quality.

The importance of the Armed Forces operations obliges all members of the defence system, especially entities dealing with personnel training and preparation for the country's defence, to constantly work on *critical consideration* of the study of this field and continuous improvement of approach, content and methods of study.

All approaches, concepts and knowledge related to the logistics of operations are also related to operations as a whole because the system that supports and the supporting system are complementary in action and therefore have to achieve maximal synergy.

There are several ways to improve thinking in the field of the logistics of operations (and operations in general), and some of them are:

- better synergy of theory and practice, education and scientific research;
- expanding the fund of knowledge and experiences through more intensive (internal and external) exchange of knowledge, experiences and lessons learned with national and international civil and military environment;
- greater implementation of proper teamwork in scenario development and modelling of operations;
- greater implementation of knowledge in the field of information systems, project management, modelling and simulation;
- greater implementation of scientific methods and techniques, software and equipment, to support planning and management;
- greater implementation of knowledge related to the quality of systems and processes.

By a combined approach, based on the principles and logic of a systemic and situational approach, aimed, on the one hand, at a general overview of the main features of the Armed Forces operations and their logistics, and, on the other hand, at presenting theoretical knowledge relevant to the Armed Forces operations, the paper has created a good starting point for improving thinking, studying and operational implementation of the logistics of the Armed Forces operations.

Changes in the approach to the logistics of operations will also initiate changes in the approach to the Armed Forces operations as a whole.

In the times of great organizational changes in the field of higher education and scientific research in the defence system, the role of the educational elite is huge. Its task is to broaden horizons and help with orientation.

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Могућности унапређења у изучавању логистике операција Војске

Императив који се поставља пред савремене логистичке системе усмерен је на постизање способности да се препозна захтев корисника логистичке услуге, да се скрати време реаговања и пружања услуге, рационализује утрошак ресурса и оствари што већа ефективност и ефикасност.

Да би се обезбедила адекватна логистика у извођењу операција Војске неопходно је, поред осталог, располагати, у довољној мери, одговарајућим кадром, који се ствара кроз процес образовања и васпитања, изучавањем правих садржаја на прави начин.

Операције Војске су обимни послови пројектног типа. Сложени су по организацији и технологији извођења, непоновљиви, ангажују знатне ресурсе који су, по правилу, ограничени, захтевају добру координацију (усклађено деловање), хомогено поступање и умешно управљање ресурсима свих врста.

Да би се обезбедио квалитет операција Војске, врло је важно остварити избалансиран поглед између општевојног менаџмента заинтересованог за збирне перформансе квалитета и логистичких стручњака који се баве појединачним специјалностима у оквиру функције квалитета.

Потребно је да систем који се подржава и логистички систем чине дијалектичко јединство и да делују више синергијски.

Неопходне праксе, захтеви времена и савремени трендови захтевају да се више ради на модернизацији начина проучавања операција Војске и логистике операција, као и развој високошколске науке, организације и технологије и коришћење снага и средстава (ресурса) када за тим има потребе.

Проучавање логистике операција Војске (и операција Војске у целини) треба да се врши на принципима и логици системског и ситуационог приступа, остварујући тројединство материје, информација и мера. Ово обезбеђује неопходно свеобухватно знање (за разлику од чињеничног и фрагментираног) и избегава калеидоскопску слику стварности.

Општа теоријска знања из области планирања и управљања, управљања пројектима, квалитета и тимског рада су адекватна основа за унапређење студијског и оперативног рада на логистици операција.

Синтеза доступних домаћих и страних, цивилних и војних, теоријских и емпиријских знања о оперативној логистици и операцијама Војске ствара солидну полазну основу за унапређење размишљања о логистици војних операција и изазива веће интересовање у Војсци и Универзитету одбране јер је ова област веома важна за одбрану земље.

Променама у приступу логистици операција иницираће се и промене у приступу операцијама Војске у целини.

Унапређење изучавања логистике операција Војске доприноси, између осталог, унапређењу личних способности, способности команди и кадра и укупних оперативних и функционалних способности Војске, као и њене способности да испуни уставне и законске обавезе.

Кључне речи: *операције Војске, логистика операција, пројектни менаџмент, унапређење изучавања операција Војске, планирање, управљање*