



NATIONAL DEFENSE UNIVERSITY "CAROL I"

COMMAND AND STAFF COLLEGE

P R O C E E D I N G S

**THE 15TH INTERNATIONAL SCIENTIFIC CONFERENCE
"STRATEGIES XXI"**

VOLUME XV, PART 2

**TECHNOLOGIES – MILITARY APPLICATIONS,
SIMULATION AND RESOURCES**

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ISSN 2668-201X

ISSN-L 2668-201X

ISSN 2668-2028

ISSN-L 2668-201X

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IULIAN MARTIN (1969-2019)

These Proceedings are dedicated to the memory of our late colleague Colonel Professor Iulian MARTIN, PhD, a true professional and a great man, Pro-Rector for Scientific Research in our university.

Born on November 23rd, 1969 in Peretu, Teleorman, Colonel Iulian MARTIN followed all the steps of the military career and, starting with 2006, he began his teaching activity as part of the faculty of Staff and Command College within „Carol I” National Defense University, obtaining the academic titles of lecturer, associate professor and professor.

Actually, the domain of education proved to be a real vocation for him as Professor Iulian MARTIN became an inspiring and motivating teacher, passionate and truly committed to his work, being able to interact with the students and fellow teachers, offering counseling and guidance to those who wished to build or develop a career in the field that he loved so much, that of Military Sciences.

As a keen scientist, he always managed to find the optimal solution for solving different issues. The position he occupied until his untimely demise, that of Pro-Rector for Scientific Research, revealed once again his remarkable qualities as a researcher, his analytical abilities and his open and friendly manner of work. He succeeded therefore in his scientific endeavor, writing an impressive amount of scientific works (books, course-books, articles and papers) and completing numerous projects that are going to serve as valuable reference to the students of „Carol I” National Defense University and not only.

The world has lost a scientist and we will always remember him as a dear colleague, mentor and friend. We will always miss him, but we will always feel grateful for having known him. Let us cherish his memory by keeping up the work he started and continue to build on the foundation he left for posterity.

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STRATEGY, FORESIGHT AND THE MILITARY INSTRUMENT OF POWER

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Abstract:

The success of a strategy depends on the foresight horizon, meaning how far ahead and how deeply the strategist can anticipate future trends and events. The nature of the current operational environment, sometimes characterized as being VUCA – volatile, uncertain, complex and ambiguous, influences the complexity of the foresight horizon. In order to cope with the complex foresight horizon, a strategy should develop an adaptive set of practices, either cognitive or structural in nature, aimed at identifying and interpreting the dynamic relationships of the operational environment. A successful strategy should be able to match emerging technologies to future social needs. Strategy and technology foresight are interlinked. Foresight informs on policy development and the development of technologies strategies. Furthermore, both foresight and technology strategies can be used equally to achieve policy objectives. Both are particularly relevant in prioritizing government policies when these emerging technologies address key security and defence challenges. This paper explores several theoretical links between strategy, forecasting and the use of the military instrument of power.

Keywords: strategy; instruments of power; predictive analysis; foresight.

STRATEGIC INSTRUMENTS

DIME is an acronym that stands for – diplomacy, information, military and economics - and constitutes a military term reinvigorated to remind the leadership and policy makers to consider national power as not limited to the military power alone. DIME (

Figure no. 1) is a way to think and categorize the power and influence of a state-actor.

A state-actor’s influence in the international system is defined by its ability to project power in the four areas of DIME. The state-actor’s leadership has the role to balance the state’s interaction with other states in terms of the four elements of DIME. In some cases, diplomacy alone will suffice in settling the outcome of certain situations/cases, whilst information is necessary as a support system for the other three elements – economic interactions occur on a daily basis and can be used to project power in different ways and in some cases military actions are needed. Each of the DIME elements has varying degrees of success or maturation within their own category. For example, a state can use diplomacy to enhance and strengthen a relationship with another state: economic interaction can be represented by trade, cooperation or development assistance or by sanctions. Information is

represented by communication (out-going information), the raw unprocessed data, and intelligence (in-coming information), the processed, relevant data.

The capacity for armed coercion plays a crucial role in international politics. Consequently, it has become a standard to refer to military power as one of the various techniques of statesmanship alongside diplomacy, economic sanctions, propaganda and subversion.

Instruments of National Power			
D Diplomatic	I Informational	M Military	E Economic
<ul style="list-style-type: none"> ▪ Embassies/ Ambassadors ▪ Recognition ▪ Negotiations ▪ Treaties ▪ Policies ▪ International forums 	<ul style="list-style-type: none"> ▪ Military information ▪ Public diplomacy ▪ Public affairs ▪ Communications resources ▪ International forums ▪ Spokespersons, timing, media and venues for announcements 	<ul style="list-style-type: none"> ▪ Military operations ▪ Engagement, Security Coop, Deterrence ▪ Show of force ▪ Military technology ▪ Size, composition of force 	<ul style="list-style-type: none"> ▪ Trade policies ▪ Fiscal and monetary policies ▪ Embargoes ▪ Tariffs ▪ Assistance

Figure no. 1 – The DIME model

PMESII is an acronym that stands for political, military, economic, social, infrastructure, and information systems (Figure no. 2). Military doctrine uses eight interrelated operational variables to analyse the operational environment, known as PMESII-PT: Political, Military, Economic, Social, Information, Infrastructure, Physical Environment, and Time.

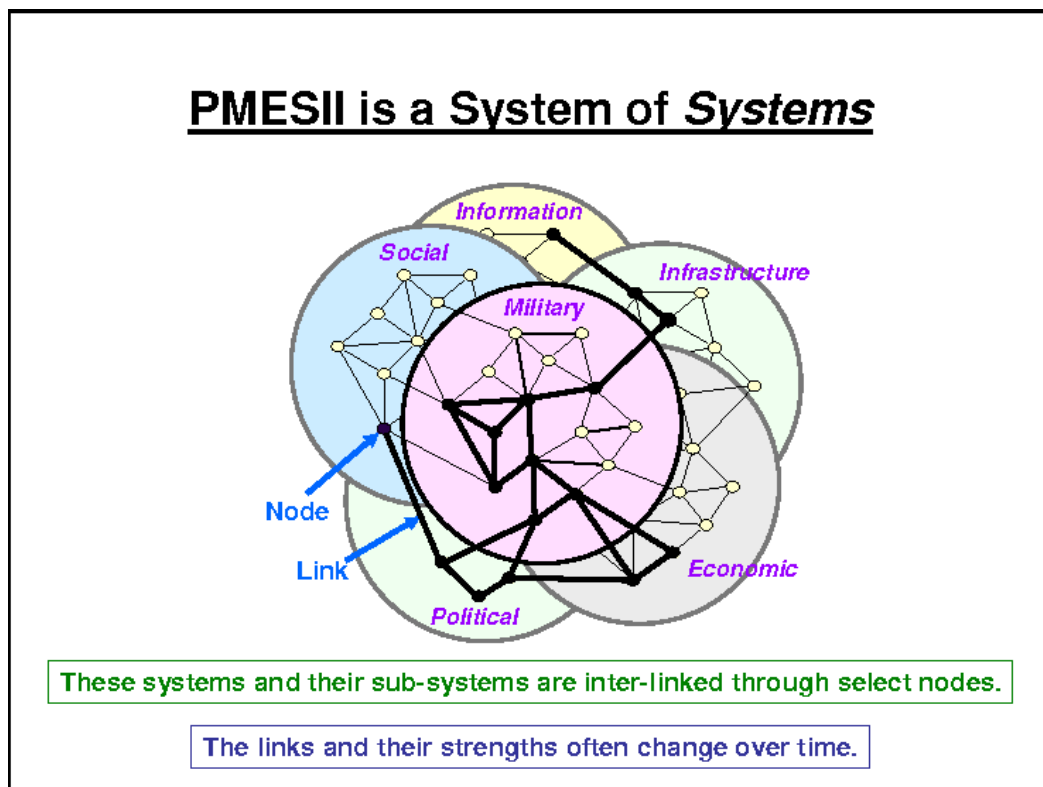


Figure no. 2 – The PMESII model

The political variable describes the distribution of responsibility and power at all levels of government; the military variable includes the military capabilities of all armed forces; the economic variable consists of the general economic categories of an Area of Operations (AO), such as energy; raw materials; government development policy; distribution of labour and labour policies; income distribution; national food distribution; free market or socialist interface and functions; consumption patterns; external investment, taxation policy; port authorities; movement of goods; consumer issues; border controls; foreign trade; tariffs etc.; the social variable describes societies within an operational environment, a society representing a population whose members are subject to the same political authority, occupy a common territory, have a common culture, and share a sense of identity; the information variable involves the collection, access, use, manipulation, rapid distribution, and reliance on data, media, and knowledge systems—both civilian and military—by the global and local communities; the infrastructure variable includes the basic facilities, services, and installations needed for a community or society to function; the physical environment variable is often the most noticeable aspect of an operational environment, with specific reference to terrain, equipment, mobility, visibility, and the use of weapons; time affects everything and influences all decisions.

ASCOPE is an acronym that stands for areas, structure, capabilities, organizations, people and events. It is a proactive and deliberate collection plan/process; at the tactical level, the collection of ASCOPE is an ongoing process that starts with initial information/intelligence gathering that is further developed and continuously updated.

- Areas: What is the relationship between people and where they live?
- Structures: Why are the natural and manmade structures important?
- Capabilities: Who is capable and responsible for providing people basic services?
- Organizations: What are the different groups of people in the OE?
- People: How do people communicate?
- Events: When do events occur?

All identified or identifiable instruments of power can be considered strategic instruments, and they shall be incorporated, analysed and used according to the specific requirements of the problem for which a strategy is being conceptualized. Presenting the DIME, PMESI and ASCOPE models prove the variability and flexibility of analysis and prediction models. Instruments of power and factors of the operational environment must be selected for analysis in such a manner as to provide the best possible framework for either strategic planning, generating viable strategic response options or even for forecasting purposes.

FORESIGHT IN THE DEFENSE DOMAIN

The key to predictive analysis is not the process in itself, but making it relevant, understandable and most importantly, actionable. If the key to any successful planning is describing an action to be conducted in the terms of the simple 5W (who, when, where, what and why) then the key to successful prediction is nothing else then describing in advance all these variables as accurate as possible and subsequently, refining that accuracy until their probability reaches a high value.

Being a cognitive process, intelligence analysis in the security and defence environment is largely similar to the one used by business intelligence analysts or by marketers that try to predict customer behaviour. However, the intricacies of the levels of war (strategic, operational, tactical) and their combination with spectrum of conflict (peacetime military engagements, stability and security, counterinsurgency or high intensity) require special tools that can deal with specific issues. A process successfully used for operational planning and execution at all levels able to enhance military action, aims to enhance predictive analysis based on the PMESII and ASCOPE analysis, has been formulated and

used by the US military and imported in the NATO doctrine. This process provides much more clarity than some other tools used for this purpose such as the Afghanistan dynamics used by ISAF during 2009-2011.

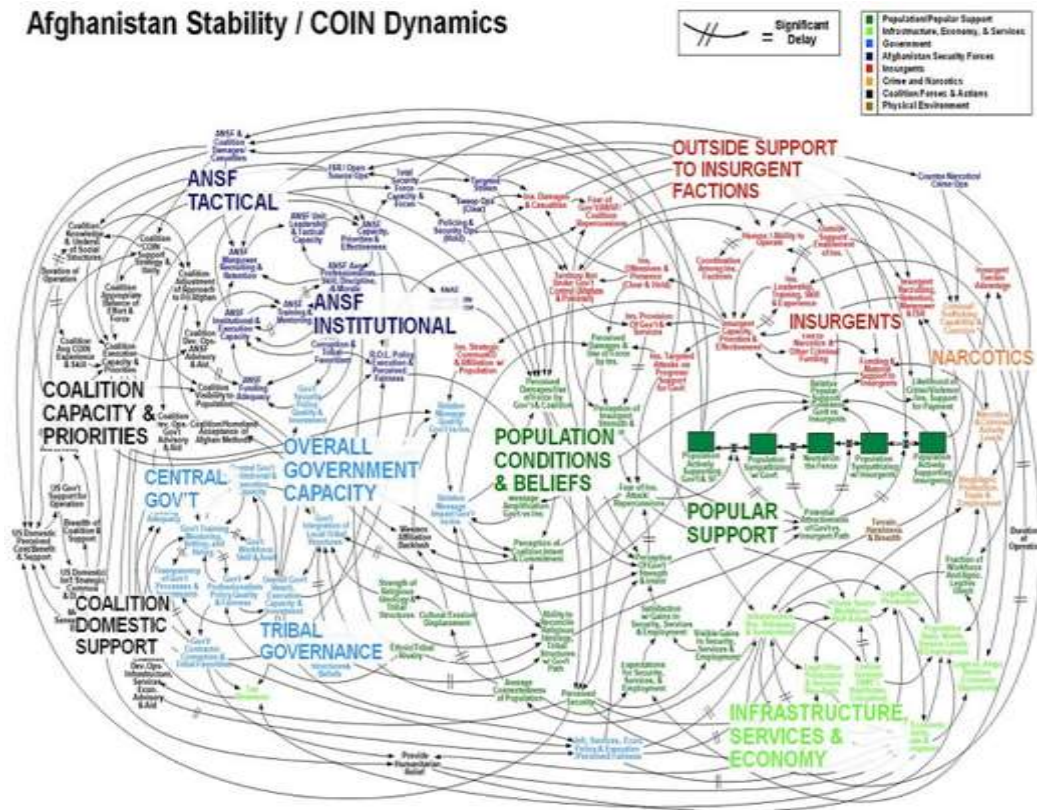


Figure no. 3 – Afghanistan Dynamics model

The PMESII variables, evolved from METT-TC, are used now to describe the now complex environment in which military force is operating, within the larger Joint Intelligence Preparation of the Operational Environment, evolved from the Intelligence Preparation of the Battlefield. When crossed with the ASCOPE fields of interest, and analysed extensively, this reveals the backbone of the subject that is to be studied.

To turn this into a predictive analysis, the analyst can use a simple cause-effect method. Based on the assessed action target area he/she reformulates a variable in this matrix and then assesses the impact and outcome of that change in the system in relation with the other variables. To provide an example, if a military action aims to establish a new base somewhere in the area of operation the analyst can offer a prediction of its impact for instance in the political domain, where the projection of force can help the provincial centre to exert power and improve local leadership. It can also host specialized equipment and forces used to build elements of infrastructure and that capability can promote governance and increase economic environment by providing freedom of movement as well as economic growth. It would help if the base operates also a radio station, promoting these support actions, improving literacy, education, providing awareness and also countering the opponent's propaganda.

Of course, the analysis can run as deeply as required, the intelligence analysts being able to provide predictive outcomes for second and third order effects, therefore painting the starting point of an operational design. The points where connections cluster can be turned into either objectives or decisive conditions for a future operation (Base constructed, Government framework enhanced, Information environment dominated) while the respective domains, military operations, infrastructure and information can be turned into lines of operations/effort.

	P Political	M Military	E Economic	S Social	I Infrastructure	I Information
A Areas	District boundary, Party affiliation areas	Coalition/ANSF bases, Historic ambush/IED sites	Bazaar areas, livestock dealers, auto repair shops	Traditional picnic areas, outdoor shura sites	Irrigation networks, water tables, areas with medical services	Radio/TV/tepaper coverage areas, word of mouth gathering points
S Structures	Provincial/district centers, Shura halls, Pooling sites	Provincial/district police HQ, INS known leader house/business	Bazaar, Wheat storage, Banks	Mosque, Wedding halls, Popular restaurants	Roads, bridges, Electric lines, Gabion walls, dams	Cell, radio, TV towers, Print shops
C Capabilities	Dispute resolution, Local leadership, INS ability to have impact	ANSF provides 24/7 security? QRF present? INS strenght / weapons	Access to banks, Ability to stand drought? Development	Strenght of tribal/village traditional structures, Mullahs	Ability to build/maintain roads, walls, check dams, irrigation systems	Literacy rate, availability of electronic media, Phone service
O Organization	Political parties, INS group affiliation, Gov & NGO org.	Coalition/ANSF present, INS group present	Banks, landholders, Merchants, money lenders	Tribes, class families, sport shuras, youth shuras	Government ministries, Construction companies	News organizations, Influential mosques, INS IO groups
P People	Governors, councils, elder mullahs, parliamentarians	Coalition, ANSF, INS, military leaders	Bankers, landholders, merchants, mousy lenders	Mullahs, Maliks, elders, shura members, influential families	Builders, Road contractors, local development councils	Media owners, mullahs, maliks, elders, heads of families
E Events	Elections, Shuras, Jirgas, Provincial council meetings, speeches	Kinetic events, unit RIPs, loss of leadership, operations	Drought, harvest, business opening, loss of business, good/bad crop	Friday prayers, holidays, weddings, deaths, births, bazaar days	Road/bridges construction, well digging, centers/school construction	Friday prayers, publishing dates, IO campaigns, project openings, CIVCAS incidents

Figure no. 4 – PMESII & ASCOPE cross – analysis and interrelations

This type of analysis provides not only an estimate of the changes in the operational environment, but can also be used in a reverse process starting with a desired aim and then going back and changing variables in accordance with the expected outcomes, therefore providing a true basis for operational planning and actions.

FORESIGHT IN ENGINEERING, INFORMATION AND COMMUNICATIONS TECHNOLOGY

Among the sectors with the highest technological content, we surely find "communications", the rapid evolution of technology is evident to all, just think how quickly the telephony changed in a few years, for example with the spread of the most recent advanced smartphones. The right choice, even in regard with apparently small details, is very important, sometimes decisive. In order to realize an effective technological roadmap, it is important to have the right technological predictions by formalized methodology and best practices, in this regard a case of telecommunications company will be described, Deutsche Telekom.

This company is the largest telecommunications company in Germany and Europe with around 200,000 employees and revenue of € 70 billion. Deutsche Telekom uses a well-defined methodology that is called Technology Radar and that allows identifying, assessing and communicating technological trends. This information is intended for different users, both for R&D to allow assessment and correction of their roadmap, and for the management that can be used to evaluate opportunities and threats in the competitive market. Furthermore, the methodology produces periodic reports that can be distributed to any employee able to exploit the information.

One of the main results of the radar is a chart (

Figure no. 5) which show a semi-circle area divided into segments, and every segment represent a different technology category: fixed & mobile devices, access networks, core networks, network services, end-user services, and cross-functional technologies: The inner part of the semi-circle identifies more mature technologies while the more external represents technologies in development. Radially the scale is divided into the following categories, from the inside out: "Market presence", "Market Ready", "Product Concept", "Applied Research" and "Basic Research". The most central side of the semi-cycle identifies more matures technologies.

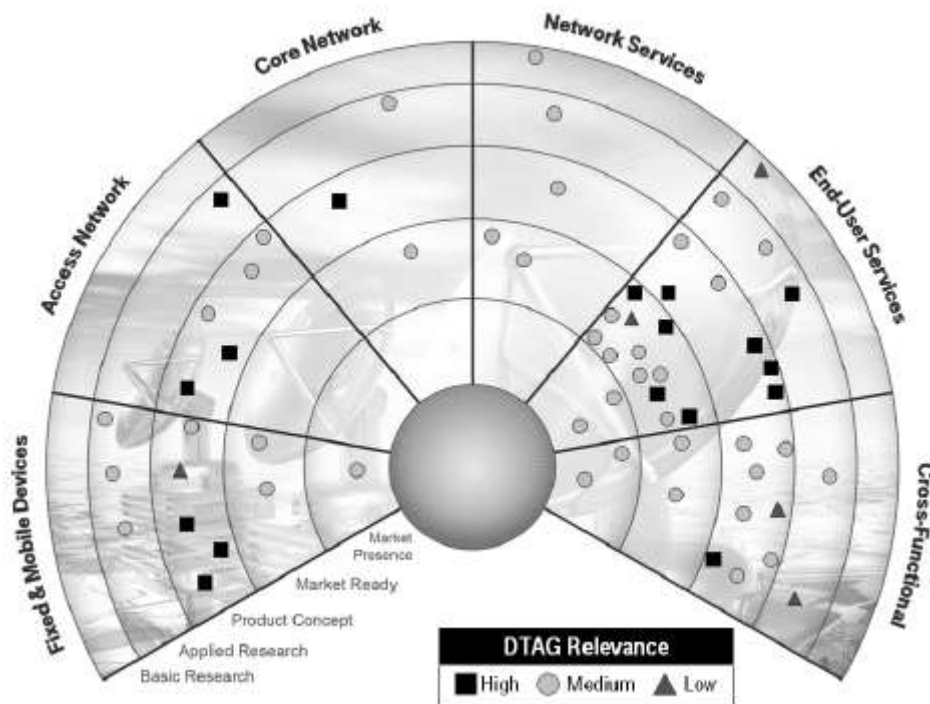


Figure no. 5 – Technology Radar screen

This representation is compiled by technology scouts, usually employees of the company, who collect technology trend and information and place one or more points on the radar indicating the reference technology. Subsequently a panel of experts coming from the corporate innovation strategy, different business units, as well as corporate R&D will select a short-listed topic, assessing their need for awareness (high, medium, or low) based on estimated market potential and technological realization complexity. Finally, a one-page for technology is created including a description of innovative aspects, technological details, research status, and business potential.

Deutsche Telekom is a company whose growth and expansion on the market certainly demonstrates excellent managerial and strategic choices. It is possible to hypothesize that these winning choices also depend on the ability to forecast technological trends thanks to a highly structured forecasting system.

This methodology named Technology Radar can be classified as Expert Opinion method including forecasting or understanding technological development via intensive consultation with subject matter experts. The most important methodology for this category is Delphi. Starting from comparing the Delphi methodology with the Technology Radar we can identify a series of best practices such as: the use of structured processes (the information flow is coordinated by researchers); iterative and reflexive processes (the experts contribute estimations, judges or opinions); data information rich processes (the approach is designed to

enable the presentation of interim and final results). Although this methodology is well structured, it does not directly define the usage of tools. This is certainly a factor of improvement that could reduce the errors caused by the human factor and could improve its speed and standardization.

Conclusion

One of the general purpose of strategic planning and strategy conceptualization is to observe and analyse the past behaviour and patterns implemented by both successful strategists, and by those that have failed. This is not only necessary to determine trends, but it can help boost innovation by applying the lessons learned from successes as well as from mistakes and failures. Forecasting, whether an integral part or a key function within a strategy is of paramount importance, given that any strategy involves normally a long enough time span, making the requirement to analyse, report upon, and integrate forecasting methodologies a key element in any strategy. Foresight exercises and technologies strategies can reconcile an array of clashing interests and are really important for decision and policy-makers in creating coping mechanisms designed to deal with the uncertainty of the current operational environment.

In this context, Predictive methodology for Technology Intelligence Analysis – PYTHIA is a good example of a European project which aims to develop an innovative methodology for performing strategic technology foresight in the defence domain. Its main objective is to provide a system with simple and intuitive technology forecasting services exploiting Big Data Analytics and text mining techniques, system which will be part of a collective intelligence environment, to be used by experts and forecasters for discovering key technology trends.

Acknowledgment: This paper has been produced as a result of PYTHIA project. This project has received funding from the European Union’s Preparatory Action on Defence Research under Grant Agreement No. 800893 [PYTHIA].

Disclaimer: The information contained in this document reflects only the authors’ view and the European Defence Agency is not responsible for any use that may be made of the information it contains.



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APPROACHES OF PROJECT MANAGEMENT IN DIGITAL MARKETING

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Abstract:

A project manager in digital marketing must be endowed with highly motivated and energetic mobility, with excellent communication and organizational skills to support the company's offerings to its own clients. (belonging to digital marketing)

The role of the project manager in digital marketing will help convert customers' needs into digital solutions. So he will be responsible for managing digital marketing projects from conception to implementation, including: websites, e-mail marketing, creative digital creatives, social media and other new media.

Applying specific project management techniques in the digital marketing area strategically assures the planning, implementation and monitoring of the steps needed to achieve the success of any digital marketing campaign.

In this paper, we will present issues that interest business people, marketers, and public organizations to design and run their own transactions, according to the terms and requirements of the digital economy.

Keywords: *digital economy; managers; marketers; digital marketing; project management; digital marketing projects; digital marketing campaigns.*

1. Introduction

The new world of marketing is constantly evolving to adapt and manage the changes that take place in the digital world.

Digital marketing is a new field in the modern business, extremely difficult, that is evolving at a faster rate. As a result, new project management strategies are introduced to revolutionize both the manufacturing and software industries.

Therefore, combining Agile methodology with project management in the field of digital marketing will eventually lead to adequate business dynamics, as well as an expected reduction in applied costs.

Inside the digital marketing of a company, a project manager is required to act dynamically and proactively in the specific processes of planning and executing the projects appropriate to the implementation of digital marketing campaigns, which are particularly important in achieving transactional goals and in the development of digital business of a modern company, regardless of its size¹.

This reveals for those involved in the planning and running of the projects to know the deadlines, the progress of each project, as well as the adequate capacity to adapt, in the limit situation, to the appearance of new clients.

¹ Schrage, M., *Invest in Digital Marketing to Control Your Destiny*, 2013, [online] Harvard Business Review. Available at: <https://hbr.org/2013/01/invest-in-digital-marketing-to-control.html>, accessed on 10.02.2019

2. Specific requirements project manager in digital marketing

By applying digital project management in digital marketing, cloud storage systems and collaborative software are used, which enables digital marketers to ensure that their work can be efficiently delivered with results that can continually exceed customer expectations.

Under the new transformations of the Information Society, the project manager is imperative in the digital marketing, for the company's success, because it ensures the planning, development and finalization of the profile projects, while satisfying the existing clients and attracting potential.

A good project manager in digital marketing has the ability to organize work, collaborate with the operations team, and present the results of projects to the management of the company, all within a limited timeframe.

At the same time, the project manager, active in digital marketing, must always be ready to answer pending questions about any project, and at the same time know how to keep the motivated team focused on the same goals.

Project managers in digital marketing field, in the simplest sense, ensure the profitable functioning of any type of companies in a digital world. They ensure that digital action plans are built in accordance with established and implemented strategies.

A digital marketing project manager often combines the online resources of a brand (including content such as eBooks, videos, social media, etc.) with specialized human resources (designers, copywriters, e-mail merchants, etc.) to create effective digital marketing campaigns².

In order to achieve the goals and objectives set at the level of the economic organization, the project manager in digital marketing converts the gross professional ideas (digital marketing) into an action plan based on the strategic objectives of the respective company. Furthermore, for the efficient implementation of the activities in the mentioned strategic plan, the mentioned project manager will proceed to the decomposition of the complex digital marketing actions into clear, well defined and achievable tasks through projects³.

To use time wisely, it is important for the project manager in digital marketing to develop certain practices and routines to ensure that he uses the day as efficiently as possible.

3. Aspects of planning specific project management actions in digital marketing

In order to achieve the planned results it is important that the project manager in digital marketing plan their day at the start of the program in the morning. He can start the work by setting progress on ongoing projects, reading and sorting data from emails, and viewing, if any, the existence of future projects, all while enjoying a cup of coffee.

As the day progresses, the project manager must contact each member of his team, in order to understand how the actions take place and accomplish the established tasks.

For the purpose, it is important for the project manager to have an appropriate system in place to control workflow that will allow him to analyze and find out what has been done and what is not. An online program will allow the manager to break down the specific digital marketing projects, according to the main tasks and sub-tasks. In this way, projects become more accessible to the profile team and, at the same time, can facilitate progress in the field of reference⁴.

² Cheryl Conner: "What Marketing Experts Can Learn From Project Management Pros", September 2, 2014, <http://www.forbes.com/sites/cherylsnappconner/2014/09/06/what-marketing-experts-can-learn-from-project-management-pros/#678749d24c85>, accessed on 05.02.2019.

³ Geraldini, J. & Lechter, T., *Gantt charts revisited. International Journal of Managing Projects in Business*, 5(4), 2012, pp. 578-594, doi: 10.1108/17538371211268889

⁴ Jami Otting: "Improve Your Collaboration: 18 Project Management Tools for Marketing Agencies" March 4, 2016 <http://blog.hubspot.com/agency/agency-project-management-tools>, accessed on 03.02.2019.

By the end of each month, the project manager in digital marketing must have the essential ability to draw up reports of achievements or failures, according to the company's objectives and customer requirements. To this end, it is necessary to collect the relevant information from each member of the project team, about each client, to be inserted into an online presentation that the client can see and understand.

Most digital marketing campaigns involve offering customer-centric services such as social media management, pay-per-click (PPC) management, and search engine optimization.

Based on these services, a project manager in digital marketing and his subordinate team can constantly get new customer information and business success. Moreover, through the services mentioned, the team engaged in project management can contribute new ideas and use appropriate software in future digital marketing projects to enhance the visibility of online customers. In Figure 3 we highlight the benefits of appropriate software in managing digital marketing projects⁵.

Through their experience and abilities, the project manager and the team they lead have a major impact on the workflow and the results. All this depends on the structure established for each project, by the manager and the profile team (project), who have the responsibility to make important decisions for each situation, related to the digital marketing, in part.

In order to establish the correct structure of the mentioned project, the managers and the profile team are usually executed, the phases of the process presented briefly below.

* The drafting of the meeting notes, so that all those involved in the project understand the mechanism of its implementation.

* Assign and schedule project tasks.

* Organization and leadership of project team members.

* Monitoring budgets and project schedules.

* Quality assurance for all project deliveries.

* Making reports with the achievements achieved within the project.

* Success evaluation based on the achievements of the project⁶.

So a company's management needs to understand the complex issues that arise in each segment of a digital marketing campaign, from content marketing and web design to social media marketing to PPC management.

4. Elements of project management implementation in digital marketing

For the proper management of specific functional processes, an effective project manager in digital marketing must master the specific theory and practice of the profile⁷.

Leading all the planned activities involves both the project manager and the digital marketing expert to manage the project-specific efforts to be carried out in the short, medium and long term.

Many marketing organizations can not only hire dedicated managers for all digital marketing projects. Thus, the need for project managers to be assigned by digital marketers who have the necessary expertise to conduct projects in the reference field.

The project manager in digital marketing is leading a team dedicated to planning, implementing and monitoring the established effort, with a clear goal and well defined objectives throughout the project.

⁵ Schrage, M., *Invest in Digital Marketing to Control Your Destiny*, 2013, [online] Harvard Business Review. Available at: <https://hbr.org/2013/01/invest-in-digital-marketing-to-control.html>, accessed on 08.02.2019

⁶ Currier, B., Mirza, R. & Downing, J., They think all of this is new: Leveraging librarians' project management skills for the digital humanities. *College & Undergraduate Libraries*, 24(2-4), 2017, pp. 270-289.

⁷ *Project Management for Digital Marketing – Two Neglected Steps*
<https://www.rightwave.com/rwi/project-management-for-digital-marketing>, accessed on 12.02.2019.

Typically, digital marketing projects primarily target major commercial exhibitions, launches and promotions of new products, and require regular reports on the achievement of established performance parameters.

While many think that project management only involves programs and budgets, they are, in fact, only two of the seven necessary steps for the success of the project, yet they are not the most important⁸.

Below we briefly present the seven steps that define and allow the realization of a digital marketing project.

- **Purpose:** why the project is realized, ie what benefits will be provided by the persons involved. The agreement on the specific purpose of the project is the key to its success. This step is often neglected, which leads to confusion, delays and cost overruns.

- **Scope:** what will lead to the project, often called a deliverable. This step has to be described in detail for geography, language and market segment. Deliveries are usually organized into a structure that involves the breakdown of work. This is one of the steps, which is usually neglected; is done too quickly and without proper details⁹.

- **Methodology:** how the results will be obtained: for example, purchases, developments or re-use, based on information from a previous project. The binomial "project-results" reveal opportunities to identify the most efficient and quick means to reach the goal of the ongoing project¹⁰.

- **Personally:** who will be hired, in terms of management and execution, to achieve the results.

- **Scheduling:** highlights when each stage of the project is completed.

- **Quality:** how good the results will be.

- **Budget:** how much the project will cost in money, equipment, commercial fund, systems and any other resource that is rarely available.

For each type of digital marketing project, the most important steps and their management will vary, depending on the specificity and resources used.

- **E-mail Campaigns:** The projects developed in the field address the objectives of such campaigns, which could be, for example, the announcement of the customers in the company's database regarding the change of the product or service; inviting customers to an event or webinar; attracting customers to visit the company's website¹¹. Maintaining excellent quality with regard to the above-mentioned actions is extremely important because the success of the company's business depends mainly on the performance of the digital marketing projects developed. In the above-mentioned context, any error that addresses address lists, email content, landing page direction, or anti-spam violation may create a major digital dysfunction. Under these circumstances, attention to detail is essential for the project management team in digital marketing as well as for profile marketers.

- **Analysis and reporting of project results:** based on the multitude of data available in: marketing automation system; sales system; web traffic; other sources.

Marketing directors need accurate, concise, current, actionable, graphical reports from project managers. To this end, it results that, as the results to be obtained are well defined, it will diminish the time involved (of the order of a few days or more) in the drafting of the

⁸ Lester, A., Project Management, *Planning and Control: Managing Engineering, Construction and Manufacturing Projects to PMI, APM and BSI Standards*. 6th ed. Oxford: Elsevier Ltd, 2014, pp. 5-22.

⁹ Currier, B., Mirza, R.&Downing, J., They think all of this is new: Leveraging librarians' project management skills for the digital humanities. *College & Undergraduate Libraries*, 24(2-4), 2017, pp. 270-289.

¹⁰ Rotimi, J.&Ramanayaka, C., *Reflective practice and technical rationality in construction project planning*. *Civil Engineering and Environmental Systems*, 32(4), 2015, pp. 301-315. doi: 10.1080/10286608.2015.1092523.

¹¹ McKinsey & Company, *Culture for a digital age*. [electronic] Available, 2017, at:<https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/culture-for-a-digital-age>, accessed on 25.08.2018.

reports. Among the most valuable reports are those that highlight the growth: effectiveness and efficiency of the campaign; profitability of marketing investments (ROMI); the influence of marketing on sales and marketing channels¹².

• **Webinars:** highlights the importance of defining the target audience and the desired response by that audience, as well as carefully selecting the appropriate webinar tools. Attention should also be paid to the invitations system as well as the use (including maintenance) of the video/audio technique. It is also very important here, the subsequent communication with the participants and the no-shows.

Based on Webinars, digital marketing projects are designed and built, including database development, fairs, exhibition presentations, selection/implementation/integration of profile tools, account-based marketing (ABM) and more¹³.

5. Conclusions

In order to efficiently use current technologies to influence and attract potential customers, a company's marketing organization needs specialized human resources that possess both digital marketing skills and project management abilities. From the recent experience of practice in the field of reference it has emerged that such dual-qualified persons are rare.

If there was no project manager, the digital marketing campaigns would be unfeasible without proper planning, and no one would be held responsible. It follows, therefore, that only this requirement is sufficient to determine that a digital marketer with competence in the sphere of project management will represent the appropriate manager or an invaluable member of the profile team.

Within a company (organization), the project manager in digital marketing is more than a project coordinator. In this respect, in order to fulfill its management tasks, the specified project manager continuously collaborates with the designated and empowered personnel of the company or from abroad, as well as with its clients, in all phases of the appropriate digital marketing project, starting from the conception, implementation, control, analysis, evaluation and reporting of the results.

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RESILIENCE IN LAND FORCES OPERATIONS

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Abstract:

The operational environment reveals unprecedented dynamics, being marked by multiple challenges and vulnerabilities that generate violence, insecurity and uncertainty at local, regional and global level.

In this context, the military phenomenon is increasingly manifested through the complexity of risks and threats. This requires the necessity of identifying changes in the operational environment, adapting strategies, and formulating appropriate response options to the crisis-generating potential or possible conflicts.

Resilience in land forces operations, as part of the military phenomenon, expresses the ability to manage existing challenges, the ability to adapt rapidly to changes occurring in the operational environment, as well as flexibility in exploiting opportunities and mitigating risks.

In these circumstances, we considered it useful to analyze the role, the features and the physiognomy of land forces' operations in a conventional conflict and find out alternative actions in domestic and multinational context.

Highlighting these elements requires studying the "culture of operability" concept. It aims at strengthening the rapid response capability by increasing proper combat power and response levels in land forces operations. Thus, the development of land forces capabilities for timely intervention in joint operations and in crisis situations will be successful ensured.

Keywords: *resilience; conventional conflict; alternative strategies; land capabilities; joint operations; operational culture.*

1. The concept of resilience

The current security environment is characterized by complexity and dynamism, being influenced by multiple challenges, generating disturbances and vulnerabilities at local, regional and global level.¹

At the same time, the pace of change in the current security environment is increasingly rapid, the challenges are ever more disruptive and produce imbalances that generate vulnerabilities and may give rise to strategic shocks of economic, military and social nature, with unpredictable consequences.

In this respect, the strategic assessment of the Black Sea area demonstrates that the security environment is constantly deteriorating, as new military and non-military challenges and threats and new forms of hybrid action emerge, requiring the identification of the operational environment changes, addressing the dominating risks and threats and against this background, adapting and improving strategies in order to respond adequately to potential crises or conflicts.

Therefore, one of the strategic objectives of the Romanian Armed Forces is to increase resilience to deal with any crisis or conflict involving national and Euro-Atlantic security.²

The concept of resilience in the military field is the process of mobilizing human resources, capable of providing solutions for adapting to the challenges and changes occurring

¹ *National Defense Strategy for 2015-2019*, Bucharest, 2015, p. 11.

² *Romanian Military Strategy*, Bucharest, 2016, p. 7.

in the operational environment, the effective management of their effects, and the adequate formulation of response options to ensure opportunities enhancement and mitigation of risks.

Consequently, we appreciate that the characteristic elements of the concept of resilience include: identifying significant risks, threats and challenges; establishing the available resources; having the ability to adapt and respond appropriately to potential consequences.

Given that military operations will be planned, prepared and executed in an uncertain security environment, subject to unforeseen strategic shocks that bring new challenges and induce changes in the balance of power, resilience gains connotations of anticipation of these situations, predictability of the potential impact and of the possible consequences and the direction of the corresponding response at multinational, interinstitutional or joint level.

Against this backdrop, we appreciate that resilience gains an anticipative, proactive, and predictable character in assessing challenges, generating capabilities and substantiating responses to maximize opportunities and minimize risks in crisis or conflict management (strategic shock).

Specialized literature plastically describes resilience as an open window to the future where cognitive skills and abilities are capable of anticipating changes in the security / operational environment, of assessing the impact of potential risks and of generating proactive actions for absorbing strategic shocks and counteracting consequences.

That is why we believe that we can associate the concept of resilience to mobility, adaptability, speed, flexibility, versatility and agility at cognitive and actional level.

The assessment of these conceptual elements leads us to say that resilience can be approached in the military as an aptitude (adaptability, cognitive flexibility) as a process (perception of change, anticipation of effects, allocation of resources) and as an effect (generating responses, monitoring actions, evaluating results).

The final outcome of these actions relates to the way in which the established objectives have been achieved, the expected effects and, consequently, the appreciation of the crisis / conflict resolution to ensure the transition to the post-crisis/post-conflict state.

The European structures are designed to strengthen resilience in crisis and conflict management by setting up leadership structures that have adaptability to change/shocks in areas of strategic interest, by operationalizing resources at multinational, interinstitutional and integrated level and by focusing on risk management/crisis resolution.³

In this context, increasing/strengthening resilience in the comprehensive approach of land forces operations must be a major objective for the Romanian Armed Forces, given their participation in the execution of a wide range of missions, in a future hostile operational environment, full of surprises and generating strategic shocks.

The predictive, predictable and proactive character of the participation of land forces in military operations in a multinational, interinstitutional and joint context is determined by adaptability to the potential risk assessment, by the training of forces and by providing the appropriate response to ensure a favorable resolution of the crisis / conflict.

Consequently, we consider that resilience implies the capabilities, abilities and skills of management structures to substantiate and develop effective management measures in planning, preparing, executing and evaluating land-based operations, taking into account changes in the operational environment, the evolution of the technological and informational component and the need to adapt the response to the nature of the challenges.

If we perform a comparative analysis between the characteristic elements of resilience (adaptability, predictability, capability generation, adequate response) in land forces operations and the components of the fighting power (conceptual, moral, physical), we observe that the two concepts are directly proportional. In this sense, increasing resilience in

³ [www.JOIN_2017_21_RO_ACTE_f\(4\).](http://www.JOIN_2017_21_RO_ACTE_f(4).)

crisis/conflict management leads to strengthening the fighting power at cognitive/decisional, moral and actional level.

We therefore welcome the integration of the concept of resilience into the activity of management structures to generate their own mechanisms and procedures that provide flexibility to change, anticipation in assessing the potential impact of risks, ability to adapt strategies, concepts and plans to provide adequate responses to crisis or conflict management.

In this context, we aim to identify the main conceptual landmarks that target the location and role of land forces in the conventional conflict and in terms of alternative strategies, and to draw some conclusions that confirm the need to increase / enhance resilience as a key element in promoting a culture of operability, characterized through responsibility and opportunity to configure and generate credible and performing military capabilities in the Romanian Armed Forces.

2. Conventional conflict

The analysis of land forces operations will take into account the existence of conventional military threats in the operational environment, based on the development of the combat potential of some state actors. In this respect, aggressive actions are possible through the use of the armed force by a potential opponent to intimidate, influence and discourage the target state and ensure the achievement of certain political objectives.

These are the conditions in which a conventional conflict may occur by the use of potential enemies of air, naval, land, and ballistic missile systems in the informational environment.

The modernization of military capabilities in the wider Black Sea area, the intentions of certain state actors to change the force ratio and threaten the states in their sphere of influence, increase the risk of triggering a conventional aggression.

In this context, resilience requires knowledge about and understanding of the changes in the evolution of the operational environment in the area of strategic interest in order to properly assess the dominant threats and their potential consequences and to select the options needed to strengthen military capabilities to respond appropriately.

Thus, we appreciate the fact that, based on the presented elements, the Romanian Armed Forces must be able to ensure the configuration, sizing, preparation and endowment of credible military capabilities in order to plan and carry out joint operations at national and multinational level.

Joint operations consist of the set of actions that are planned, prepared, executed and evaluated by a force group which includes ground, air, naval, military forces for special operations, communications, IT, cyber defense and logistic support in the area of distinct operations, under a single command, exercised by a joint HQ.

From this perspective, the joint force can be constituted at the national level from command and control structures, components of military categories and information and logistical support facilities, and, at NATO level, by integrating the national operational force package into a multinational group of joint forces.

Regardless of the context, land forces (operational component, force structures) are integrated within the cluster of joint forces in order to meet strategic objectives through tactical operations and actions.

In this respect, the ground forces play an important role in joint operations, being able to control, occupy or defend the area of responsibility through maneuver, strike and protection capabilities, in cooperation with the other components of the force.

The main forms of action of the land forces in the conventional conflict are offensive and defensive operations, which are achieved by identifying, locating and locking the potential enemy, and exploiting the benefits of integrating forces at a joint level.

That is why we appreciate land-based operations must be addressed in a joint context, even if there is a time and space delimitation of their missions.

In the process of planning at a joint level, the strategic objectives are transformed into operational plans that define tactical actions by establishing command and control or support relationships between the components of the force and the modalities of integration and synchronization of the land, air and naval forces missions in the area of joint operations to gain and maintain superiority (control) in the physical and informational environment, initiative and freedom of maneuver and strike in order to achieve the expected effects.

In this respect, we consider it important to change the paradigm at the level of the headquarters of the operational component of the land forces in the sense that it is necessary to select those content elements of the joint operation plan that ensure the knowledge and development of a common understanding and the design of an integrated and synchronized vision of the battlespace in what regards the physiognomy of the operation, the missions of the force elements and the nature of the relations between them.

Thus, the interaction of land forces with air forces, naval forces, and special operations to integrate and synchronize missions becomes of paramount importance in joint operations.

Depending on the level of operational advantage obtained through the actions of their informational, electronic and airborne systems, the land forces capitalize on the initiative and the tactical superiority in the design of the forces and ensure the fulfillment of the missions through maneuver, strike and protect ability.

For the success of the operations carried out by the land forces, there are some conditions that must be created in the operational environment, at joint level, by sizing and interlocking the three shields: informational, electronic and air. In this respect, we appreciate that only under conditions of informational, decisional and aerial superiority, can land forces maximize their fighting power to hold, control or preserve national territory (the area of responsibility), destroy or neutralize the adversary's land forces, secure and protect the established goals.

Air forces supports land forces operations based on action coordination and synchronization plans, by maintaining airspace control in the area of responsibility, by engaging and neutralizing the opponent and its infrastructure.

Another way air forces support land forces is by organizing air transport for the purpose of rapidly deploying structures in areas of interest or by executing airborne operations.

Naval forces can directly participate/influence the operations of land forces, both by projecting force and by engaging in combat.⁴

To this aim, the naval forces provide the projection of the land forces for the execution of offensive amphibious operations and of maritime defense anti-airborne operations.

In order to ensure the successful execution of these missions by the designated land forces, the information and air superiority must be guaranteed at joint level, ensuring sea control and the cooperative organization of the missions in order to optimize the actions of own forces executed from the sea and to prevent the opponent's maneuvers from the sea to the shore.

Regarding the cooperation of special operations forces with land forces, the support is not typically offered directly, but through the higher echelon. Thus, the commanders of land forces structures are the beneficiaries of important information about the opponent and its infrastructure elements and they can use this data in decision-making and target management.

Through the discussed problems we wanted to emphasize the fact that it is necessary to increase the resilience in terms of the knowledge of the changes in the operational environment, to understand the evolutions and the predictable consequences for the continuous adaptation to crisis and conflict-generating situations and for an effective intervention in solving their effects.

⁴ SMG/PF-3, *The Doctrine for Joint Operations in the Romanian Army*, Bucharest, 2014, art. 140, para. (5).

Consequently, in the case of conventional threats and challenges, land forces are integrated in joint operations, and the actions taken are those specific to armed combat.

At the same time, we appreciate that land forces must have the required capabilities to cope with potential unconventional risks, generating CBRN conditions / environments in the joint operations area.

In this respect, land forces should include CBRN defense structures (CBRN cells, modules) within the command and control units of large units and subordinate units, leadership and action elements for CBRN warning and reporting systems (subsystems), units and subunits of CBRN defense to support operations under CBRN conditions / environments.

The issue of approaching operations in CBRN conditions / environments should be understood and solved at joint level through integrated and synchronized CBRN capabilities of land, air and naval forces.

Without detailing the problems, we aimed at providing a point of view on how to address hybrid threats by the joint forces and implicitly by the land, air and naval structures of their composition.

We know that hybrid threats involve combining several types of military, non-military, informational, cyber, psychological, unconventional and asymmetric actions to achieve political goals. Although hybrid threats include the conventional component, we consider the actions of the opponent in the informational, cybernetic, psychological and media environment to be interdependent, intertwined in the economic and diplomatic fields to influence, discourage and threaten the target states.

In this case, hybrid actions are supported / sponsored by the potential adversary who has conventional military capabilities, which is a threat and it does not exclude their use in a limited situation.

Given that the potential enemy uses the armed force against the target state and becomes an aggressor, by executing combat missions in the air, land and naval space, the hybrid war turns into a conventional conflict where the laws and principles of armed combat are applied.

That is why we appreciate that the actions of the armed forces to counteract hybrid threats are limited to measures carried out by specialized structures in the information, cyber, psychological and media fields, combined with the activities of other information, public or civilian institutions.

Thus, we consider that military structures (land, air, naval) participate indirectly in the fight against hybrid threats through elements specialized in non-kinetic or unconventional actions, their main objective being to prepare and deploy the defense operation in a joint context at national level and within NATO.

Therefore, we believe that targeting activities to increase / enhance resilience in the development of land forces performance should take into account that they have predominantly kinetic capabilities, use lethal means, are integrated into the joint operation, and assist the other components with countering conventional threats and achieving strategic and political goals.

3. Alternative strategies

The unprecedented dynamics of the operational environment generated a diversification of risks and threats as well as of the actors involved in crisis or conflict situations.

In this sense, armed combat is no longer a viable solution for some actors, since they can only counteract the informational, technological and decisional superiority of their opponent, being in an obvious actional disproportion. Thus, a breakthrough occurred in the classical armed conflict, dominated by conventional lethal actions, which has led to the emergence of the concept of asymmetric threat. This has generated new forms of military

action called asymmetric war, insurgency operations, guerrilla, terrorism and organized crime, security operations, peacekeeping operations etc.

This reality has generated new efforts from states to increase resilience in identifying changes in the physiognomy of military action to adapt strategies and doctrines to counter asymmetric (irregular) threats.

This has led to the apparition of alternative strategies to classical operations, generalized in the concept of asymmetric warfare. It encompasses an atypical, irregular set of actions carried out by non-state actors, actions that compensate for the informational and technological superiority of the opponent in order to achieve political goals without respecting the customs of the war.

In this sense, asymmetric actions are considered complex retaliations, usually by non-state actors, carried out in a hostile operational environment, with long-term consequences which can seriously erode the institutions and values of modern societies.⁵

In order to counteract asymmetric threats, alternative strategies envisage a distinct typology of actions, called crisis response operations.⁶

Compared to conventional operations, these have different characteristics and features. Military actions are combined with other means of reducing violence, controlling the area of action, supporting civilian population, restoring, maintaining, imposing and building peace, restoring constitutional order, reconstructing and granting humanitarian aid.

In this context, crisis response operations include: irregular operations (counter-insurgency, counterterrorism, organized crime), peacekeeping operations, humanitarian assistance operations, stabilization and reconstruction operations, evacuation of non-combatants, extraction of forces, imposition of sanctions and embargo, ensuring freedom of movement for the use of navigation and airways.⁷

Considering the complexity of alternative strategies materialized in crisis response operations, the question is to what extent armed forces (land, air and naval structures, special operations forces) are involved in their planning, preparation and execution.

The lessons learned from the evaluation of the set of actions carried out in the theaters of operations attest to the fact that the armed forces participate in the execution of the crisis response operations, being dimensioned and endowed in accordance with the nature of the missions, considering the existence of a hostile operational environment, the attitude of the civilian population, of the leaders and of the other actors involved, culture, religion, language, customs and taking into account political, legal and media constraints.

Against this background, land forces participate with mission-oriented structures (usually combat / maneuvering, protection and logistics units) to crisis response operations, according to their commitments. Thus, we appreciate the successful participation of units in the composition of the land forces in cooperation with airborne structures, forces for special operations, local military authorities and structures in counter-insurgency, counter-guerrilla, counter-terrorism, and organized crime.

Insurgency is a form of asymmetric combat that uses subversion and violence to overthrow a governmental authority or force it to change.⁸

Counter-insurgency refers to the interaction between own forces, the civilian population and the adversary, which involves changing the paradigm in engaging forces, from the concept of “winning through destruction” to the concept of “secure-stabilize-support”, to

⁵ Dr. Gheorghe Văduva, *Asymmetric Warfare and the new Physiognomy of armed conflict*, “Carol I” U.N.Ap. Publishing House, Bucharest, 2007, p. 13.

⁶ AJP-01, *Allied Joint Doctrine*, Edition E, Version 1, February, 2017, 2-21

⁷ AJP-01, *Allied Joint Doctrine*, Edition E, Version 1, February, 2017, 2-21, 2-22, 2-23.

⁸ Strategic Impact Magazine, no.4/2014, p. 78.

achieve success by destroying the fighting will of the opponent and helping the affected population to secure and stabilize the situation and rebuild during the post-conflict period.⁹

Guerilla is the combat side of the insurgency that uses asymmetric procedures to conquer and maintain areas and produce losses and destruction.

Counter-guerilla uses combat means and procedures for neutralizing and destroying radicalized elements.

Counter-terrorism includes preventive, defensive and offensive measures designed to reduce the vulnerability of own forces against the violent and irregular actions of terrorist groups.

We also consider that adequate dimensioning, endowment and training of structures in the composition of the land forces ensure their participation in the execution or the provision of the conditions for the execution of peace support operations, humanitarian assistance, stabilization and reconstruction, evacuation of non-combatants and extracting forces from the conflict area.

Generally, these types of operations become inter-institutional operations, because they involve military and other non-military (civilian) structures.

In order to successfully participate in these types of operations, the training of the land forces structures is of particular importance, with the effort directed towards carrying out inter-institutional tactical exercises based on the elaboration of complex scenarios.

This does not mean abandoning / reducing the training of forces for the planning and execution of the joint operation in order to counteract a conventional or an unconventional threat, but a that balance must be struck between the two forms of training.

We consequently appreciate that resilience-building activities in addressing crisis response operations require increased adaptability to changes in the operational environment in order to identify effective solutions that determine the size of the forces and the corresponding intervention, taking into account the fact that military (land forces) structures participate in the execution of inter-institutional operations in hostile environments.

4. Operational culture

An important objective at the level of the Romanian Army's leadership is to maintain a high level of the operational state of the armed forces in order to efficiently fulfill the assigned tasks.¹⁰

At the same time, NATO has reevaluated and redefined the concept of "operational culture", because the dynamics of the security environment requires new ways to re-establish military strategies across the spectrum of risks and threats in areas of strategic interest.¹¹

In order to analyze the concept, we first wish to define the terms of the concept, culture and operational.

Concerning the term "culture", we will only refer to the fact that it emphasizes the opportunities and responsibilities that generate efficiency in the activity carried out in an expected environment.¹²

The concept of operability (not to be confused with the operative phrase) expresses the quality of a system to act quickly, with high efficiency and efficiency.

It follows that the concept of operational culture refers to the manner of assuming responsibilities and identifying opportunities for the configuration, sizing, training and endowment of military capabilities that act quickly and efficiently in a hostile operating environment for the management of strategic shock.

⁹ *Ibidem*, p. 86.

¹⁰ *Romanian Military Strategy*, Bucharest, 2016, p. 8.

¹¹ *Brussels Summit Declaration*, 11-12 July 2018.

¹² https://cssas.unap.ro/ro/pdf_studii/diferente%20culturale_dintre_armata_si_societate.pdf

The analysis of these elements confirms the importance of operational culture for increasing resilience in approaching military operations.

In this respect, the operative culture targets the entire spectrum of credible, trained, deployable, interoperable and prepared capabilities and forces for the entire range of missions. This approach is based on reinforcing resilience in order to increase the operational and response level of the Alliance and the Member States. At the same time, the operative culture generates the necessary actions to strengthen the fighting power and the ability of the forces to react in order to achieve the expected deterrence and defense measures.

Only through concrete measures to strengthen the fighting power and the capacity of the national and multinational forces to react can the Alliance's strategic objectives of deterrence, adaptation and if necessary, of collective defense against any potential adversary be achieved.

Thus, operational culture should provide a framework to motivate increased resilience in approaching military operations, understanding the changes in the operational environment, adapting concepts and strategies, developing and strengthening military capabilities to generate a rapid and effective response to managing a potential crisis / conflict.

Given the existence of a wide range of threats in the wider Black Sea region, NATO aims to maintain and consolidate the full range of military capabilities able to respond adequately to all challenges and to generate credibility when implementing strategic concepts of deterrence and defense.

These elements converge towards strengthening the Alliance's response capability in the Black Sea Strategic Area through measures of strengthening Member States with high mobility active forces, capable of rapid military interventions in crisis situations and enforcement, if necessary, of joint or combined operations.

In our opinion, identifying at the level of the Alliance solutions to strengthen the capacity of response in the Black Sea region by sizing and developing a land command and control capability at the army level and strengthening the advanced presence adapted to the territory of Romania, which includes land structures, air and maritime structures, is a concrete action to increase resilience in addressing deterrence and defense measures in a strategic interest area.

In this respect, increasing resilience within the Romanian Armed Forces should aim at a high level of operational state through which national military capabilities are able to generate combat power and to actively contribute to the execution of crisis management, deterrence and defense missions.

At the same time, the operational culture changes the order of approach of the military phenomenon in the sense that not the strategy / concept generates the effective response in crisis or conflict situations, but also the existence of credible, technologically-advanced and powerful military capabilities determine the reconfiguration of the concepts and imposes the appropriate response to counteracting threats and coping with the challenges of the operational environment.

As a distinct structure in the Romanian Army, the Land Forces, which participate in the entire range of missions entrusted by executing deterrence, crisis response, joint and combined operations, must develop their own operational culture in order to increase credibility and efficiency.

To this aim, the efforts made to acquire modern categories of military armaments and equipment, communication and information systems and cyber defense systems, confirm the fact that the importance of the concept of operational culture has been correctly understood and is applied to enhance resilience as a key element in increasing the performance of land forces in the whole spectrum of operations carried out in a dynamic and unpredictable operational environment.

That is why I appreciate the importance of identifying the elements that define and characterize the concepts of resilience and operational culture in order to understand the ways

in which the management staff at all levels are responsible to develop and implement the necessary methods and procedures to maximize opportunities and minimize risks in the process of planning, preparing and executing military operations.

In conclusion, I consider that the understanding and application of resilience in the efficient approach of land-based operations involves measures and actions aimed at configuring and dimensioning credible and performing military capabilities and ensuring a high level of operability that generates added value in the planning, preparation and execution of joint operations and crisis response.

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PARTICULARITIES OF PLANNING PROCESS AND INITIAL TRAINING FOR CBRN CONSEQUENCE MANAGEMENT IN NATO

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Abstract:

Crisis management is one of NATO's core tasks. National, regional and local authorities usually lack common CBRN doctrines & SOPs to effectively coordinate preparation and response. The expert knowledge of uniformed services and staff in management positions is particularly challenged by CBRN incidents. The difficulty of perceiving damaging substances, of defining them quickly and correctly and of specifying their short- and long-term impact, is characteristic of CBRN incidents. NATO recognises that the military alone cannot resolve a crisis or conflict, and lessons learned from previous operations make it clear that a comprehensive political, civilian and military approach is necessary for effective crisis management. During the preparation for CBRN incidents, it is a good idea to network right from the start with experts from responsible institutions and expert authorities in order to be quickly able to generate the necessary expert information, if an incident occurs. Even so, the CBRN consequence management planning process should never be viewed as covering all the possible aspects of emergency or crisis situation.

Keywords: *Crisis management; CBRN consequence management; CBRN defence; planning; training.*

1. Introduction

“The NATO’s Comprehensive, Strategic-Level Policy for Preventing the Proliferation of Weapons of Mass Destruction (WMD) and Defending against Chemical, Biological, Radiological and Nuclear (CBRN) Threats” was developed and implemented in 2009, grounding a new approach to CBRN defence at the Alliance level.

In this context, the Alliance's main mission in CBRN defence area is that "NATO will actively work to prevent the proliferation of ADM by state and non-state actors to protect the Alliance if prevention of a threat fails and be prepared for recovery in the event of a CBRN attack/ incident, within its competence and whenever it can bring new additions, through a comprehensive political, military and civilian approach. "¹

Thus, at the level of the Alliance, there can be noticed a very important issue based on the necessity for a comprehensive approach to CBRN defence at political, military and civilian levels, to counter CBRN threats in line with the CBRN consequence management (CM) pillars: prevention, protection and recovery.

¹ “The NATO’s Comprehensive, Strategic-Level Policy for Preventing the Proliferation of WMD and Defending against CBRN Threats”, 31st March 2009.

The Alliance's Joint CBRN Doctrine reflects the concepts, fundamentals and principles of NATO's policy on CBRN prevention and countering CBRN threats to Member States, and includes measures coming from the three pillars embodied in operational components, CBRN defence missions and tasks across the full spectrum of military operations.

It results from this approach that the CBRN CM (recovery) at NATO level is a basic pillar of CBRN defence and overlaps the two others operational components, hazard management and the support and medical countermeasures.

Generally speaking, we define CBRN CM (Recovery) as a pro-active concept of limiting/ eliminating the effects of a CBRN attack/ incident to ensure/enhance survival and to maintain the operational capacity in order to continue missions.

Starting from this definition, we understand that CBRN CM concerns the planning, preparation and execution of CBRN post-attack/ incident measures, when the prevention and protection do not have the desired success.

However, Allied Joint Doctrine for CBRN defence defines CBRN CM as „*Measures taken to mitigate the damage, loss, hardship and suffering caused by catastrophes, disasters or hostile actions. It also includes measures to restore essential services, protect public health and safety and provide emergency relief to affected populations*“.²

Thus, we assert that the CBRN CM is a process that involves the planning, preparation, execution and evaluation of missions of the designated structures for intervention.

In this regard, the planning phase for CBRN CM operations starts when a task force (TF) or unit(s) receive a mission from its headquarters to conduct an intervention when a CBRN attack/ incident happens or to support force operations within CBRN environment. Figure 1 outlines the planning phase relative to the other phases of a CBRN CM process. A CBRN CM task force and/or subordinate units must assess their capabilities to support or conduct CBRN CM operations dependent on the mission task analysis. The effects analysis will identify the respective TF/Unit specified tasks to be conducted as “CBRN CM Operation” or “CBRN CM Operation’s Support.” A CBRN CM plan is an ongoing process requiring review, and updates permanently, as changes occur.

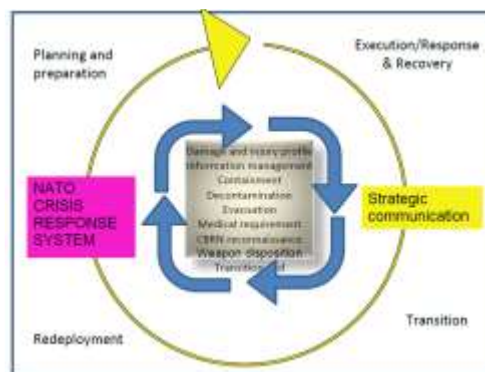


Figure 1

The supporting TF and units’ plan can be an operations plan (OPLAN) or a contingency plan which can be converted to an operation order (OPORD) to execute or support operations. CBRN CM planning involves conducting assessments of the operational environment (including the threat), vulnerabilities, capabilities, and risks. Response unit planning is conducted similar to other military mission planning. The unit uses any regular method to plan its missions. In this regard, the used methods are parts of military decision-making process.

² AJP-3.8., “Allied Joint Doctrine for Chemical, Biological, Radiological and Nuclear Defence”, Edition A, Version 1, March 2012.

There are two types of operational planning: contingency and crisis response planning. Contingency planning is based on scenarios and hypothetical situations for configuring a contingency plan.

At NATO level, contingency plans are developed for each predicted CBRN threat level, so that response structures and gradual measures that can be executed are properly dimensioned.

We consider that it would be useful to develop contingency plans that include hypotheses on the prevention and countering of CBRN threats, depending on their level, in the Romanian Armed Forces.

Crisis Response Planning addresses measures to address an incident, crisis or conflict. In the analysed situation, the response involves the planning of a CBRN CM operation, the dimensioning of intervention structures, establishing missions and their limits.

An important element in the planning of a CBRN CM operation is the information needed in order to take the actions in a timely manner and effective.

In this respect, essential information needed to plan a CBRN CM operation is: general (specific support requested by civil authorities, affected personnel profile and damage, awareness of staff in relation to cultural, gender, and religion information), prevention (sheltering, camouflage, concealing, deception), hazard control (CBRN reconnaissance, evacuation, decontamination, medical requirements) and post-conflict (transition and disengagement, provisions on arms handling, force protection) ³.

The presentation of the conceptual elements of NATO policy and doctrine in the field of CBRN threat prevention and countering, by correlating CBRN defence pillars, components, missions and tasks, allows us to address in a comprehensive manner consideration regarding the CBRN CM planning and the training of response structures.

2. Planning Considerations

While not distinct from a doctrinal perspective, the inherent potential for mass destruction and/or mass effect of WMD, and the timing and circumstances of the counterforce operation present the military planner with unique requirements. Operational risk, ISR timeliness and accuracy, targeting, and international law are all areas for special consideration when planning CBRN operations. Intelligence should directly support strategy, planning, and decision-making, and facilitates risk management assessments.

An effective defence plan takes into consideration active defence capability sets (detect, divert, and destroy) with various planning considerations for each of the layered-defence domains (i.e., space, air, and surface).

CBRN contingencies could well have impacts across national borders, so response effectiveness could depend on allies working together. While NATO members have specific resources that they are willing to share, lack of means could create problems in ensuring a timely response to requests for assistance.

During preparation for the CBRN CM, four basic situations, but different as a conceptual approach are possible: CBRN CM operations under Article 5; CBRN CM in non-Article 5 operations; responding to the request of an affected nation; support during events with high visibility.

CBRN CM operations under Article 5 are the result of CBRN attacks/ incidents in collective defence. In this respect, the effects of the CBRN attack/ incident are complex and require a coherent set of actions to limit and remove its consequences, maintain operational momentum and combat strength.

³ IAW AJP-3.8. (A) Annex D, CBRN CM.

Regarding the planning of this type of CBRN CM operations, according to Article 5, the following elements should be considered:

- National incident response organizations of the stricken nation(s) maintain initial response requirements.
- NATO troops are available in theatre and/or in the territory of the alliance.
- A limited amount of CBRN units and respective CBRN medical support will be available for assistance.
- If the situation allows, associated CBRN elements could immediately support crisis intervention efforts.
- Augmentation of CBRN elements might be required in support of CBRN CM initiatives.

Associated Challenges:

- A CBRN incident may result in a subsequent CM requirement in which HN resources consisting of, but not limited to, essential services, protection of public health and safety and provision of emergency relief, will be exceeded.
- In the absence of an established civilian government, the HN military commander may play the role of the lead local civilian authority and therefore be responsible to initiate and coordinate CBRN CM measures.
- The balance of the mission and CBRN CM support to civilian population must be carefully considered and weighed so as not to adversely affect the military operational mission.
- Presence of NGOs/GOs is likely.

CBRN CM During Non-Article 5 Operations addresses crisis response operations where CBRN incidents are likely to occur. In this context, the intervention of the specialized structures is planned gradually, depending on the extent of the risk or the effects.

Regarding the planning of CBRN CM in non-Article 5 operations, the following elements should be considered:

- National incident response organizations of the stricken nation(s) may or may not maintain initial response requirements.
- NATO troops may or may not be available in theatre – if it is not territory of the alliance.
- None or limited CBRN assets to include CBRN medical support will be available for assistance.
- None or very limited capabilities available for first response.
- NATO force generation process for CBRN capabilities is essential.

Associated Challenges:

- Military will act in a supporting role. However, the national/local government may need assistance for the formal request to NATO.
- National/local government may or may not be established.
- National/local CBRN CM capabilities may be limited or non-existent.
- In the absence of an established civilian government, the NATO military commander could be responsible to initiate and coordinate CBRN CM measures.
- The balance of the mission and CBRN CM support to civilian population must be carefully considered and weighed so as not to adversely affect the military operational mission.
- NGOs/GOs may be in theatre.

Responding to a Request of a Stricken Nation is generated by the imminent possibility/ occurrence of a CBRN incident by means other than attack (industrial accidents, RBC terrorism, etc.) and requiring the intervention of NATO forces.

In this context, the planning of response to the request of an affected nation takes into account the following elements:

- No NATO troops in a theatre.
- Deployment of tailored forces in support of mission requirements.
- Military will act in a supporting role.

- NATO troops can support recovery and transition operations but not initial response due to time constraints (limited notice to move).
- EADRCC-coordinated civil assistance will be provided upon request (no notice to move).

Associated Challenges:

- A CBRN incident may result in a subsequent CM requirement in which HN resources consisting of, but not limited to, essential services, protection of public health and safety and provision of emergency relief, will be exceeded.
- Request will define the level of support.
- Integration into already ongoing activities.
- Adherence to HN rules/regulations, standards, etc.

High Visibility Event Support is determined by the occurrence of CBRN events/incidents requiring the intervention of specialized structures.

Planning support during high visibility events takes into account the following elements:

- The minimum CBRN CM requirements to cover existing gaps and/or enhance existing capabilities are defined and agreed.
- Detailed CBRN CM planning and reconnaissance in place in accordance with identified/suspected CBRN threats to include associated risk assessment/threat assessment.
- Pre-deployments in case of perceived/received threats at high visibility events.
- Command and control among different players are clearly defined and established.

Associated Challenges:

- The NATO CBRN task force is fully integrated into national crisis response plans.
- The NATO CBRN task force adopts and adheres to HN regulations and standards.

The comprehensive approach to dealing with CBRN CM involves planning and conducting political, military and civilian measures and actions to ensure resolution of the incident and restoration of the initial state.

In this respect, without detailing the general activities that involve the planning of the CBRN response for CBRN CM, we present the following elements that need to be considered: implementation of the Hazard Management Plan; planning CBRN reconnaissance; sending of CBRN messages; planning routes to bypass contaminated areas; planning for redistribution of forces and dispersion control; decontamination planning; planning CBRN medical support; waste management; re-evaluation of CBRN post-incident measures.

The synthesis of these elements reflects the complexity of the activities planned and executed by specialized structures for the management of CBRN attacks/incidents, regardless of the operational situation.

3. Training considerations

Training to prevent and countering CBRN threats, including CBRN CM, is an important element of the operation process.

Below we will present the main issues that need to be considered at national and multinational level to train staff to manage the consequences of the CBRN attack/ incident.

Because emergency response remains a national responsibility, most NATO members conduct national-level exercises. Although they also carry out joint exercises, they are often ad hoc, being limited in scope and means.

In order to understand the best way to train personnel for managing CBRN crises, is good to keep in our mind that traumatic events are often:

- Sudden and unexpected
- Extremely dangerous
- Distressing
- Include physical or emotional loss or risk of loss
- Of physical or emotional nature, because they include losses or the risk of producing victims

- Disrupt a sense of control of the event
- Challenge a belief that the world is fair and equitable.

It is difficult to protect oneself against an “invisible unknown enemy”. That is why people who are directly affected (injured people, relatives and witnesses) as well as the population in general but also emergency response personnel and management staff might be filled with feelings of fear, uncertainty, helplessness and loss of control when confronted with CBRN incidents. It can happen that emergency response personnel arrive at the scene of the incident without knowing that they have to deal with a CBRN event. Therefore, on top of it all, they might be concerned about their own health, when they learn about the nature of the incident.

When contamination is unavoidable, protective countermeasures allow personnel to survive and operate in a CBRN environment. It is important to plan for and develop these protective countermeasures prior to CBRN attack. The commander should optimize the appropriate level of protection based upon the specific threat (type, quantity, hazard, and means of delivery), anticipated warning time, duration of exposure, and the actual or projected attack location. Protective countermeasures include restriction of movement to limit exposure of forces to hazardous agents via limiting interactions between personnel (restricting large gatherings, closing facilities, quarantining, and isolating), collective protection (shelters), immunizations and chemoprophylaxis, and individual protective equipment (IPE). If forces have advance warning of an attack, personnel protective measures and adequate MOPP can increase survivability of the forces during operations. However, the occurrence of a biological attack may not be determined until personnel become symptomatic, in which case personnel protective measures may be of little use.

Managers in leading positions have a key role both in the provision of necessary means and approval of specific procedures. Naturally, this also applies to the preparation of the mission. Whether psychosocial knowledge as the basis for recommended procedures and abilities is acknowledged, learnt and practiced, depends, to a large extent, on the question whether the managers are open to such an approach.

During the preparation for CBRN CM missions, the following steps are recommended:

- The systematic training of the emergency response personnel in aspects of psychosocial crisis management during CBRN incidents.
- The preparation of information material for the affected persons on the site of the incident and for those who wait outside the closed off area.
- The preparation of the structural inclusion and alarm of psychosocial emergency response personnel and the inclusion into exercise scenarios.
- The provision of specialized mission aftercare with medical experts.

Accordingly, some general and specific training considerations should be implemented during the planning phase.

General Training Considerations:

- Understand the Incident Command System and the Command and Control arrangements between civilian First Responders and military forces deployed in support.
- Improve knowledge about civilian CBRN defence capabilities (based on known CBRN defence components) and tactics, techniques and procedures (TTP).
- Consider the different Individual/Personal Protective Equipment (IPE/PPE) used by the civil responders and partners.
- Most First Responders will use Self Contained Breathing Apparati (SCBA). For those who don't, and use negative pressure respiratory protection, their filters/canisters may be different from those of the NATO personnel and may not be interoperable with other respirators or COLPRO facilities.
- Identify capability shortfalls in the unit (e.g., available COLPRO facilities) and mitigate them through cross functional training initiatives.

- The use of common CBRN Warning & Reporting procedures and formats (i.e. based on ATP-45), including CBRN Warning & Reporting Software to be trained⁴.
- Coordinate CBRN situational awareness, including knowledge about the effects and impacts of CBRN releases.
- Selection of mission-oriented Detection, Identification and Monitoring (DIM) capabilities should be considered and harmonized.
- Mission oriented protection measures of all involved civil/military organisations must be harmonized.
- National differences in Operational Exposure Guidance (OEG) for military personnel and civilian first responders must be considered.
- Investigative questions by higher commands may initiate special considerations for the CBRN incident response chain in SIBCRA missions.
- Due to different requirements regarding the handling of contaminated civilians and military personnel, the use of decontamination procedures has to be clarified (e.g., gender, religion of contaminated personnel, types of decontamination agents).
- Clarification of terminology used in CBRN defence area, as a interoperability key element.
- Synchronize capabilities from civilians and partners in order to establish unity of effort.

Specific Training Considerations:

- Train CBRN leaders and staff planners in roles and responsibilities in the CBRN CM Operations to also include medical support personnel training.
- Establish Liaison/co-location of C2 elements between civil and military units.
- Improve cultural awareness (e.g., gender, religion, tradition, customs).
- Use training to identify constraints between civil and military CBRN CM capabilities.
- Provide specific training for mutual liaison elements in respect to the Area of Operations (AO).
- Improve awareness of intentionally accepted standards and guidance for CBRN CM (e.g. IAEA, WHO, OPCW, SEVESO II).
- Ensure the participation of all CBRN CM organisations to also include medical support requirements in joint combined civil/military training, workshops and exercises.

From the above, it is noted that training for CBRN CM requires a comprehensive approach at an interinstitutional and multinational level so as to ensure an effective and timely manner response.

4. Conclusions

Chemical, biological, radiological and nuclear weapons are among the most dangerous weapons in the world. It is important to ensure that first responders are prepared for such eventualities and that decision makers get timely scientific and operational CBRN information to protect populations.⁵

Many crisis management operations have their own objectives and end-state depending on the nature of the crisis, which define the scope and scale of the response. A proper crises and CM system, planning and preparedness scheme – organizational, training and equipment wise – allow to prevent or diminish a potential impact of CBRN events/incidents

A comprehensive CBRN defence approach means to take a lot of aspects into considerations while conducting CBRN CM, which includes response to and recovery from

⁴ IAW SHAPE AD-75-3.

⁵ „Preparing first responders for CBRN incidents”, from http://www.nato.int/cps/ic/natohq/news_115712.htm, on 25.10.2018.

an incident and lead to mitigation of consequences on civilians and military personnel. CM is impossible without responding units equipped and trained beyond the typical military standard to protect troops against WMD. These units must be adapted and properly trained for fulfilment of specific tasks of CBRN CM.

Major civil emergencies can pose a threat to security and stability. Because CBRN CM is challenging and could imply a massive, costly and protracted effort, NATO is prepared to provide its capabilities to national authorities, if requested. NATO has considerable CBRN defence capabilities to offer to Allies' and partners' first responders and it also serves as a forum where planning arrangements for such eventualities can be coordinated among countries. Upon request and on a case-by-case basis, NATO is prepared to assist with CBRN defence assessments; provide specialised equipment, CBRN training facilities and opportunities and so on.

Given the high priority of CBRN defence, planning and training are crucial. All military forces must be confident that they can operate effectively in a CBRN environment. To facilitate this, they should receive regular training on CBRN CM operations facing all the general and specific aspects.

In conclusion, the presented aspects regarding planning and training for the of CBRN CM at NATO level should be taken into account in the Romanian Armed Forces in order to increase the credibility, efficiency and opportunity in intervention.

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PARTICIPATION OF THE ROMANIAN NAVAL FORCES IN PROMOTING CONFIDENCE AND STABILITY IN THE BLACK SEA AREA

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Abstract:

Armed conflict occurs in situations where diplomatic solutions have been exhausted. Military cooperation and regional initiatives are diplomatic solutions that can prevent the escalation of the conflict situations.

Cooperation policy represents a key tool in the struggle to increase security, stability and threat reduction by providing individual states with a maritime identity to be used in the maritime space and the maritime domain. The enhancement of regional cooperation and solidarity has proved to be an essential instrument for security in the Black Sea region.

In the authors' opinion, regional naval cooperation is the most important factor for the enhancement of stability, security and peace at the Black Sea.

Keywords: Security and cooperation; military cooperation, regional initiative, CHENS; BLACKSEA HARMONY; CSBMs.

The geopolitical and security developments in the Black Sea region associated with its geographical position, the innate risks and threats, and also the political, economic and military cooperation advantages have drawn the interest of European and transatlantic organizations. Therefore, Romania's foreign policy priorities put the Black Sea domain in focus and consider this area to be "a very important issue of national interest".

"The nations are changing, the borders are re-shaping, the ideas that guide humanity as a whole are altering, but the big regional problems persist". These words, written by Nicolae Iorga at the beginning of the last century, explain why geopolitical landmarks, despite of political, economic or social transformations, are true constants of the history and have a practical application, in our opinion, to the Black Sea current environment.

It is evident that the importance given to this region fluctuates from one era to another. Ancient times witnessed a competition between the great powers of those times and later evolved into a domination of the Byzantine Empire, the Ottoman Empire rule, and finally the Russian/Soviet influence, that during the Cold War isolated this region from the rest of the world. Apart from Turkey, the Black Sea was surrounded by the Soviet Union and Warsaw pact states, which placed it in a shadowy, smoldering state.

With the expansion of NATO and EU into the Black Sea, this region was brought back into the spotlight. Its transformation is linked with the changes of the regional security

environment, derived from the new values of democracy and the market economy, as well as emerging risks, threats and vulnerabilities associated with the new strategic balance.

Terrorism, organized crime, illegal immigration, the proliferation of weapons of mass destruction and corruption are phenomena that can hardly be tackled separately and are major sources of instability in this region through their sheer scale and effects upon society.

Frozen crises and conflicts in the Romanian area of interest, and consequently for the European Union, are unpredictable both in configuration and progress. It is highly likely that some frozen conflicts will get hotter, or end up with dramatic solutions due to poor management of influence. This space of great importance for both Europe and Asia has taken a secondary seat, being surpassed by the renewed interest in the Extensive Middle East area.

During the Cold War the threats came from the West for most of the Black Sea countries, but the new security environment overturned this hierarchy. The geography is no longer the only element of an imminent aggression. The new threats are breaking geographical barriers to the extent that one can no longer distinguish it as internal or external one. Nowadays it is hard to segregate internal security threats from external ones, so consequently, adopting a national strategy to include all of the regional, global geopolitical factors is the only way forward.

For Romania, the Black Sea region is not only a source of risks and threats to security, but also provides many economic opportunities that, if effectively exploited, can contribute to the accomplishment of Romanian interests, knowing that the economic security represents the foundation of national security.

On our opinion, the political and strategic methods to achieve the stability and security in the Black Sea region could be: the design and realization of an international security architecture to prevent wars and to establish lasting stability and peace as grants for democracy; the expansion of international security (NATO), political (EU) and economic organizations that can ensure the security and prosperity of the area; the peaceful solution through diplomatic dialogues, of the numerous conflicts in the Black Sea region that will trigger its evolution from a security-consuming area into a security-generating area¹; the realization of common, beneficial projects to enhance the prosperity, security, stability and good neighborhood.

By its classic definition, international cooperation has positive meanings, and represent "deliberate adjustment of policies by the states that look for common solutions or mutual advantages"². Generally, the security cooperation has increasingly highlighted the fact that security of a state cannot be separated from that of its neighbors. Romania considers the regional and international cooperation as an integral part of its security policy, sustaining its readiness through active participation in trust and security initiatives at the regional, continental and global level.

Albert Einstein, the greatest scholar of the past millennium, has captured a fundamental truth: smaller states can only promote their interests by using the most exquisite weapons they have: political ability and diplomatic wisdom.

"Cooperation is focused on economic development and the prevention and eradication of the risk factors that could generate erosive effects on regional stability and security"³. In this context, the regional cooperation between riparian states and those of the Wider Black

¹ Dorin Dănilă, *Contribuții ale Forțelor Navale Române la cooperarea militară regională și la integrarea României în Uniunea Europeană*, p. 8.

² Alexandra Sarcinschi, Grigore Alexandrescu, *Modalități și posibilități de amplificare a cooperării în zona Mării Negre*, „Carol I” Navy Defense University, 2005, p. 7.

³ Dorin Dănilă, *Forțele Navale în contextul noilor provocări la securitatea și cooperarea în regiunea Mării Negre*, *Gândirea Militară*, nr. 3/2007, p. 75.

Sea Area adds a necessary and important dimension to the overall security strengthening efforts and is increasing the efficiency of existing instruments and mechanisms. This responsibility lies with all state institutions, political parties and citizens, as mentioned in the Constitution and national laws of each country.

In recent years, the Black Sea riparian states, as well as various international organizations linked to the maritime domain, have become increasingly active and interested in the security and stability of the region. The security and cooperation in the Black Sea region have been safeguarded and maintained since the end of the 20th century by some initiatives that constituted landmarks in international policies and military developments.

The fundamental goal of Black Sea riverine states is to create, in the long term, a space of stability, security, prosperity and democracy, functionally and beneficially connected to European and global processes. Romania continues to invest energy and political creativity in achieving tangible results through the Black Sea Economic Cooperation and Black Sea Forum reform – BSEC, the promotion of the Black Sea Euroregion, as well as other projects proposed by regional and European partners, aiming to the development of a Black Sea dimension within the European Neighborhood Policy.

At the regional level, the Ministry of Defense coordinates Romania's involvement in the political-military cooperation initiatives, such as: Process of the South-East Europe Defense Ministerial reforms (SEDM)⁴, Romanian-Hungarian Peacekeeping Battalion (RO-HU BAT); Multinational Romanian-Hungarian-Slovak-Ukrainian Engineer Battalion (TISA)⁵; Central European Peace Support Cooperation (CENCOOP); Black Sea Naval Cooperation Group (BLACKSEAFOR); Black Sea Border Security Initiative (BSBSI)⁶.

Among these initiatives, a special attention is given to those initiative that are conducted to increase the security in the Black Sea region, with the significant involvement of the Naval Forces. Naval cooperation between riparian states is the subject of the Confidence and Security Measures Document in Europe, in force since 2003. This document contains clear references to cooperation in the terrorism prevention domain and provisions for assistance in combating organized crime and illicit drug and weapons trafficking. The Confidence and Security Building Measures (CSBMs) Document is a tool that provides a solid basis for regional efforts in this direction. This document specifies cooperation in the naval domain as well as contacts at different levels, invitations in naval bases, exchange of information and annual exercises aimed to increase mutual trust.

Romania's significant dependence of the Black Sea and its maritime interests drives its need to perform activities securely on the sea lines of communication and to ensure freedom of movement on the global seas and oceans, within international commitments framework. If security on sea lines of communication is necessary and imposed in peacetime, the more it becomes vital in crisis or war situations.

⁴ The author's note: The Process of the South-East Europe Defense Ministerial reforms (SEDM), designed for developing regional military cooperation, supporting the reforming process of the Balkan armies and integrating into the North Atlantic structures, under which the following projects were developed: Military-Political Initiative of Regional Cooperation – MPFSEE; South-Eastern Europe Simulation Network – SEE SIMNET; Interconnection of Military Hospitals (IMIHO).

Military Support to WMD Counter-Proliferation, Border Security and Counter Terrorism (CBSC); Cooperation on Defense Industries, Research and Technology (SEEDIRET); South Eastern Europe Military Education Cooperation (SEMEC); Multinational Peace Force South-Eastern Europe (MPFSEE); South-Eastern Europe Brigade (SEEBRIG).

⁵ IMPACT STRATEGIC, no. 4/2009, *Regional cooperation in the Balkans and Scandinavia. Particular approach – global effects*, p. 28.

⁶ www.mapn.ro/diepa/cooperare/initiative_regionale.htm, viewed on February, 03, 2019.

The major risks facing Romanian society at the beginning of the millennium may create threats to the national security and influence the evolution of Naval Forces development capacity in a significant manner. We believe that at least two important policy directions are required: diminishing the negative influences upon the evolution of the situation on the medium and long term over the current state of the army and, implicitly, of the Naval Forces, and creating the capacity to manage these risks in order to be able, with the forces and means, to respond in crisis situations to the threats to Romania's national security in its area of responsibility.

Within the operations and regional initiatives framework involving the Romanian Navy, the most important are listed below:

1. The CHiefs of European NavieS forum – CHENS, representing an informal, independent and apolitical forum, composed of the heads of the Naval Forces of each European maritime nation, a member of NATO or the EU. CHENS meets annually through the participation of the heads of the Military Marines⁷.

CHENS promotes cooperation between Member States' Naval Forces in order to analyze elements of mutual interest within the maritime domain. At CHENS annual meetings, it is discussed issues of common interest in order to identify new topics that will be subject to analysis by the working groups and for the harmonization of their views.

The strategic intention of the CHENS is to support the development of a European Maritime Security Strategy, based on existing, national and multinational, military or civilian initiatives, and taking into account all involved actors and organizations.

In the last decade, CHENS has become a very important forum, where visions are exchanged about the new challenges of the naval environment and their possible ways of solving them. CHENS offers its own contribution to the evolution of the European naval vision through EU military institutions. The main issues discussed during the meetings are as follows: the European naval vision for 2025, which, in essence, requires a balanced, adaptable and interoperable European maritime presence as fundamental to a European security strategy; the effectiveness usage of the Naval Forces in the EU Military Dimension (EUMD); the ships protection in ports; the European maritime dimension and security; the European Inter-Agencies Strategy for Maritime Security Operations (MSO); the EU Green Paper on Maritime Policy.

However, within the many civil and military initiatives at different stages of evolution and designed to defend the EU's borders, nowadays there is no framework that brings both civilian and military elements and to fight effectively, coherently and collectively against all threats coming from the sea.

In the future, CHENS will support the development of an MSO inter-agency. Such a strategy allows nations, multinational agencies (e.g. EMSA, FRONTEX, EUROPOL) and international organizations to cooperate effectively in order to combat hostile and illegal threats and maritime safety and security. It is also recommended that the development lines in this document be adopted by appropriate military bodies, in partnership with major civil authorities, and with accent on cooperation and exchange of data information.

We believe that the development of a European Maritime Security Inter-Agency Strategy for MSO must take precedence over any other regional strategy and include strong commitments with UN bodies and, in particular, with the International Maritime Organization (IMO).

2. Black Sea Naval Cooperation Group – BLACKSEAFOR. The idea of setting up a multinational maritime force to act "on call", to which all Black Sea littoral states participation, was initially exposed by Turkey in 1998. This idea has found strong support in the Ministry of National Defense, the Ministry of Foreign Affairs and the Government of

⁷ <https://chens.eu/about.html>, CHiefs of European NavieS, viewed on February.08.2019.

Romania, just as it happened in the other five countries bordering the Black Sea.

After three years, the Agreement establishing the BLACKSEAFOR group was signed on 2nd of April 2001. The stated goal, underlined in this agreement, is to help strengthen the friendship, good relations and confidence between the Black Sea states (Bulgaria, the Russian Federation, Georgia, Romania, Turkey and Ukraine) and to promote peace and stability through cooperation and the interoperability of the naval forces.

Efforts to set up BLACKSEAFOR were the subject and concern of the expert group, consisting of diplomats, navy officers, legal advisers and other authorized persons.

The main missions of the group include search and rescue (SAR), humanitarian assistance (HA), mine counter measures (MCM), environmental protection, reciprocal visits to ports, other missions agreed by consensus of the participants.

Within BLACKSEAFOR, all decisions are made by consensus at both meetings of senior national representatives (foreign ministers/defense ministers or their authorized representatives) and the Black Sea Naval Commanders Committee (BSNC).

As a "on call" force, BLACKSEAFOR was activated⁸ to conduct planned actions at least once a year. Romania took over the BLACKSEAFOR group's order twice, between August 2005- August 2006 and August 2010-August 2011.

There are some particularities in the command and control process within the BLACKSEAFOR group, as follows⁹:

- The Parties retain full command (FULLCOM) of its assigned ships to the BLACKSEAFOR. Therefore, ships may be withdrawn for national purposes any time, providing that the other Parties are informed.

- The BLACKSEAFOR is under the operational command (OPCOM) of the Black Sea Naval Commanders Committee (BSNC), who is responsible for the overall planning of the BLACKSEAFOR activities.

- The BSNC delegates operational control (OPCON) to a flag officer named as OPBLACKSEAFOR and nominated by the Party, which the Commander of BLACKSEAFOR (COMBLACKSEAFOR) is from.

- In case the COMBLACKSEAFOR is withdrawn by his state for any reason and from any operation, including the UN or OSCE-mandated operations, operational control of the BLACKSEAFOR will be assumed according to the rotation principle by the representative of the next Party.

- Tactical command (TACOM) of the BLACKSEAFOR is assigned to its Commander (COMBLACKSEAFOR).

- At sea, the tactical command is transferred through the COMBLACKSEAFOR order from one ship to another for conducting series or group of series;

- The rotary control is the model of the BLACKSEAFOR control structure.

Activities carried out until 2014, the year when the group's activities were suspended following the turmoil in Ukraine (Crimean crisis in 2014) demonstrated that BLACKSEAFOR is an important initiative to increase confidence and security in the Black Sea area, as well as a sustainable element of supporting the existing political and military initiatives in the region.

⁸ The author's note: The first activation took place between September 27 and October 16, 2001, with host country Turkey. The second activation took place between August 5-28, 2002, under the leadership of Ukraine. The third activation took place between August 3 and August 31, 2003, with Bulgaria host country. After the first three activations characterized by a certain routine of activities, the fourth activation, hosted by Georgia, took place in two stages: August 3-27, 2004, when the usual activities at sea, with emphasis on operations Asymmetric Risk Protection, and April 4-27, 2005, when the vessels participated in the BLACK SEA PARTNERSHIP 05 exercise. During 2006 and 2013 the activations took place in two stages.

⁹ https://www.dzkk.tsk.tr/icerik.php?icerik_id=248&dil=eng&blackseafor=1, viewed on February, 08, 2019.

3. BLACK SEA HARMONY OPERATION – OBSH¹⁰. Turkey initiated OBSH on March 1, 2004, in order to maintain safe ship traffic through the Straits, but also along the vital sea lines of communication in the Black Sea area. This operation is conducted in accordance with the principles contained in the United Nations Agreement and the objectives set out in United Nations Security Council Resolutions 1373, 1540 and 1566.

The mission of OBSH is to conduct periodic maritime surveillance operations in areas of naval and air jurisdiction under international law, to conduct suspicious vessel recognition operations, tracking/oversight, presence of naval forces on traffic routes commercial ships.

The position of the Black Sea states regarding to this initiative of Turkey is the following: Ukraine became the first state who responded to this invitation, the bilateral consultations at the level of Turkish-Ukrainian experts materializing by signing at Prime Ministers level, the Protocol on the Participation of Ukraine at the OBSH on January 17, 2007; The Russian Federation also announced its participation, and the Turkish-Russian cooperation finalizing by signing on 27th of December 2007 a bilateral Protocol on the participation of the Russian Navy in Black Sea at OBSH; Romania expressed its openness to cooperation with Turkey within the bilateral meetings. Thus, starting from the draft Memorandum of Understanding (MoU) proposed by the Turkish partners on the occasion of the first round of experts' talks on Romania's participation in Black Sea Harmony (Ankara, 24.08.2006), it was elaborated the draft Memorandum of Understanding between the Government of Romania and the Government of the Republic of Turkey on cooperation in the "Black Sea Harmony" Operation. The negotiation took place in Bucharest, on May 20-21, 2008, based on the Romanian MoU draft, as approved by the Supreme Council of National Defense by Decision no. 3 of 2008¹¹.

The MoU draft contains provisions on purpose, definitions, regulatory domain, management and responsibilities, information security and cryptographic material, amendment and revision, duration, extension and end of validity, entry into force.

Under the approval of the Supreme Council of National Defense, the Chief of the Naval Forces signed the MoU between the Government of Romania and the Government of the Republic of Turkey on cooperation in the Black Sea Harmony Operation, on 31st of March 2009 in Istanbul.

The purpose of the MoU is to establish both the legal framework of cooperation between the two parties in order to combat the risks regarding to the maritime security in the Black Sea as well as to establish the working methods and responsibilities relating to the exchange of information between the Turkish and Romanian Naval Forces.

The signing of the document is in line with Romania's efforts to ensure the security and stability in the Black Sea region, as well as the traditional relations of cooperation with the Republic of Turkey.

4. Confidence and Security Building Measures - CSBMs. Naval cooperation between riverine states are subject of the Document on building confidence and security in the Black Sea region (CSBMs), signed on 25 April 2002. The CSBMs Document is joining the six countries bordering the Black Sea, namely Bulgaria, Georgia, Romania, Russian Federation, Turkey and Ukraine, and expresses their commitment regarding to building confidence and security in the region, as well as their principle that the regional security arrangements make a significant contribution to overall stability in Europe. The document on maritime confidence and security measures in the Black Sea is a tool that creates a solid basis for regional efforts in

¹⁰ https://www.dzkk.tsk.tr/icerik.php?dil=0&icerik_id=27, BLACK SEA HARMONY operation viewed on February, 15, 2019.

¹¹ https://english.mapn.ro/cpresa/3111_Romania-will-participate-in-Black-Sea-Harmony-Operation, Press release no.101/03.04.2009, MoD, viewed on February, 15, 2019.

this direction. This document specifies the cooperation in naval domain, contacts at different levels, invitations in naval bases, exchange of information and annual exercises to increase mutual trust.

Each littoral state must invite, once a six years, representatives of all the other parties to one of its naval bases for an information related to the actions and activities carried out. Within CSBMs it is very important the exchange information in the naval domain, to know the Black Sea naval activities of the parties, to visit each other, to observe their main naval activities. Thus, annually the parties shall inform each other, regarding to the total number of combat vessels with a maximum displacement of 400 tones and above, submarines with an immersion displacement of 50 tons or more, amphibious vessels.

5. Joint regional exercises, PfP and NATO. Together with the above mentioned initiatives, Romanian Navy contributes to the already established regional maritime exercises such as BLACK SEA PARTNERSHIP, TURKISHMINEX and DOGU AKDENIZ - with Turkey; SEA BREEZE in Ukraine or BREEZE, SEA SHIELD and POSEIDON - with Bulgaria. It has also become routine preparing the ships belonging to NATO's permanent maritime groups (SNMG2 and SNMCMG2) or naval forces of the countries with experience in the maritime domain, such as United States, Turkey, and United Kingdom. The multinational exercises to which the Romanian Navy participated aimed to strengthen cooperation with the naval forces of the NATO members as well as within the Partnership for Peace. These participations also played a key role in promoting regional and global confidence and stability.

By successfully engaging for improving regional security and stability, we the authors have intended to emphasize that the Naval Force is the key element in defending the maritime interests of our country and thereby the way of promoting the national interests. To achieve this goal, the major policy of Romania and military priority must be the building of an effective, credible and multifunctional naval forces capable of acting in areas of national interest not only in the Black Sea but also in other parts of the world.

We consider that, at the regional level, naval cooperation must become the most important factor for strengthening the stability, security and peace of the Black Sea littoral states, as well as an effective tool in fighting against the illicit activities through the active ships presence at sea.

Romania, relying on its naval forces, consistently pursues the policy of imposing its maritime interests in the Black Sea region and aims to remain a credible partner within the Alliance, capable of responding to any kind of threat to the regional and global stability.

We believe that the interconnection of existing initiatives and I want to remark here not only to military ones, but also to diplomatic, economic and cultural ones has to concern the political and military decision-makers.

Both Romania and other littoral states have increased responsibilities in terms of promoting regional and global confidence and stability. Definitely the concerns about cooperation for ensuring the regional and global confidence and stability are not limited to the issues that have been presented above. There is a number of currently projects underway covering different domain of political, economic cooperation. Some are the result of private or bilateral initiatives at national level, others target all or almost all states in the area. However, it is clear that the new political and security realities require to re-evaluate the situation, to make an additional effort in order to harmonize and to make it more effective, or to try to find new methods of exploiting the opportunities, and to ensure the effective participation of Euro-Atlantic institutions.

In conclusion, we maintain that the most important feature for strengthening the stability, security and peace of the littoral states of Black Sea region should be the regional maritime cooperation.

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THE MAINTENANCE OF MECHANISED INFANTRY BRIGADE MILITARY EQUIPMENTS WITHIN JOINT OPERATIONS

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Abstract:

From the technical point of view, the operating state of a military structure is directly influenced by the quality and opportunity of insuring maintenance. Especially within the united operations, the flow of activities that have as their object the maintenance, evacuation repair or replacement of equipment has a decisive effect on the continuity of the actions of the fighting forces regardless of their type (manoeuvre, battle support or logistic support), according to the matrix of integration in the operational design.

Together with medical support, equipment maintenance represents a factor that influences the moral of the troops. A fighter that knows that he can rely on a reliable fighting equipment, adequate to the mission he needs to fulfil, will have a good mental state knowing that there is a system capable to ensure a high operating level.

Keywords: *maintenance; equipments; efficiency; joint operations.*

1. General notions

Maintenance is a functional field of logistics and encompasses all the activities fulfilled in order to maintain/re-establish equipment at the specific functioning characteristics.

The planning of maintenance of the equipments is realised according to the quantity and complexity of the technique in order to ensure a high level of efficiency, by structures which plan and lead logistic support, through the deputy of the S4 logistic module chief, based on the logistic support order belonging to the superior echelon and on the decision of the commander of the great tactical unit¹.

The efficiency of the ground, air and naval forces is conditioned by the preventive and corrective maintenance of the equipment, both in times of peace and during the deployment of the operations.

When planning the maintenance activities, the maintenance compartment has to take into consideration the fact that these should be made as early as possible. The judicious planning of these activities during the deployment of the operations held by the mechanised infantry brigade is important especially for extending the lifetime of the materials and in order to limit the completion needs².

¹ Mînculete, Gheorghe; Andronic, Benone, *Tactica structurilor de sprijin logistic-curs universitar*, Editura Universității Naționale de Apărare Carol I, București, 2015, p. 36.

² Andronic, Benone; Mocanu, Bixi-Pompiliu, *Sprijinul logistic al acțiunilor militare ale unei brigăzi mecanizate*, Editura Centrului Tehnic-Editorial al Armatei, București, 2008, p.335.

Maintenance activities are organised and executed according to the specific norms and instructions, constructive, functioning, maintenance and repair particularities, applied to all serviced equipments.

Equipment evolution determines the maintenance system's evolution and has an effect on establishing the needs to attaining the Integrated Logistic Support.

Through his structure, the maintenance system takes into account³:

a) respecting the national legislative framework, as well as the Ministry National Defence's legislations – regulations, instructions and standards – which regulate the maintenance system's functioning;

b) the engineering and technical staff assigned to the management and execution of the maintenance works, structured according to specialisation and professional training level;

c) the military training institutions which instruct the staff which will deploy its activity in the maintenance area;

d) the quantity and quality of the equipments;

e) the equipments, machinery, infrastructure, measuring and control resources, the gear and mobile means with which the maintenance works are executed both in times of peace and during the operations;

f) the equipment with which the computer system of the logistic is attained;

g) the financial resources necessary for the execution of the maintenance works with full efficiency;

h) the efficiency level of equipments;

i) the existence of potential authorised and accredited economic operators, capable of taking charge of some maintenance works regarding the military equipment;

In order to be efficient, the maintenance system fulfils the following main needs:

a) planning, organising and executing the maintenance activities according to deadlines, amount of work and related costs;

b) preventing the unplanned inoperative rendition of equipments;

c) reducing the immobility time of equipments;

d) optimising maintenance costs;

e) establishing the way in which maintenance is conducted and executed;

f) configuring the military units' network at army level;

g) identifying the relations between the specific research, projecting, manufacturing/acquisitioning, exploitation and maintenance domains;

The nowadays challenges in the modern battlefield have imposed an integrated approach in order to assure the equipment maintenance.

The integrated logistic support represents the managerial process of the product, during his entire functionality, with the purpose of supporting the development and integration of the following elements belonging to the individual logistic support, in order to purchase and support weapon systems:

a) maintenance of the product throughout its entire functionality;

b) the technical-engineering staff request for exploitation/maintenance;

c) instructing the staff regarding usage and maintenance;

d) ensuring a package of information, like the manual of the product, the repair manual, the nomenclature of its spare parts, the manual containing the necessary operations for its storage/conservation, technical specifications and exploitation parameters;

e) assuring the testing and diagnose equipments;

f) supplying spare parts and accessories;

g) aspects regarding the valorisation and scrapping of the equipments rendered inoperative;

³ L-11/1, vol.1 *Instrucțiuni privind mentenanța echipamentelor de blindate, automobile și tractoare din înzestrarea Armatei României*, București, 2003, p. 47.

Within the integrated logistic support, in the Romanian Army there is a combined, classical and externalised maintenance system, based on the concept of preventive and corrective maintenance.

According to state of the equipment and moment when works are being deployed, maintenance can be preventive or corrective.

Preventive maintenance encompasses an aggregate of activities deployed for maintaining the equipments in normal functioning conditions, through the execution of works such as: control, diagnostics, adjustments, periodic maintenance and revision, planned at intervals established according to the equipment and usage time⁴.

Corrective maintenance consists of an aggregate of activities deployed in order to re-establish the normal functioning capacity of broken and/or deteriorated equipments due to normal usage as a result of exploitation or because of taking part in military actions and are executed through: low, medium or high complexity repairs. These activities encompass operations such as: testing/diagnosing, repairing malfunctions through the replacement or through mending the malfunctioning elements, checking and executing adjustments⁵.

Depending on the complexity of the works, the time of equipment immobilising, maintenance is planned, organised, lead and executed on the following levels⁶:

- combat level – procedures of preventive and corrective maintenance, with equipments immobilising, on a short period of time;
- intermediary level – procedures of preventive and corrective maintenance, with equipments immobilising, on a medium period of time;
- complex level – procedures of preventive and corrective maintenance, with equipments immobilising, on a long period of time.

The levels of maintenance determine the specific tasks, the amount of the maintenance works, as well as the necessary capacities for its development.

Equipment maintenance encompasses the following associated activities: technical control, testing/diagnosing, maintenance, revision, operational classifying, recovery, evacuation, repair, monitoring and technical training of the staff⁷.

2. The maintenance of the mechanised infantry brigade equipment within joint operations

2.1. Planning equipment maintenance, within the general spectrum of the planning process of the operations

Planning maintenance represents the attribute of its leading structures and in an activity encompassed within the planning process of the operation, deployed by the mechanised infantry brigade/battalion quarters. This activity starts during the third phase of planning (orientation), when the situation is evaluated taking into consideration the data base of the structure and specified/deduced responsibilities, limitations and determining factors that influence maintenance are identified/determined. In the fourth phase (the outlook's elaboration), maintenance represents a distinct item within estimating the logistic support, of the logistic acknowledgements and the assuring conception of the logistic support.

During the preparation of the operation, the officer responsible for maintenance and the chief of S4 logistic module need to plan, organise and lead complex activities in order to achieve the highest possible maintenance indicators (coefficients) and, first if all, a technical

⁴ SMG/L-1 Doctrina logisticii operațiilor întrunite, București, 2008, p. 31.

⁵ *Ibidem*, p. 31.

⁶ *Idem*.

⁷ L-11/1, vol.1 *Instrucțiuni privind mentenanța echipamentelor de blindate, automobile și tractoare din înzestrarea Armatei României*, București, 2003, p. 62.

state coefficient as close as possible to 100%. Also, taking some determined measures to increase the completion coefficient is also mandatory⁸.

The final document of equipment maintenance planning process is the maintenance plan, a planning and leading document which is elaborated within the fifth phase (the elaboration of the plan/action order).

The maintenance system is composed of leading and execution structures.

At the mechanised infantry brigade's level, the maintenance structures are:

- a) the technical deputy of the S-4 Logistic chief;
- b) the maintenance office/brigade, battalion.

The technical deputy of the S-4 Logistic chief/brigade, battalion is the one directly responsible with planning maintenance and managing military equipments.

The maintenance execution structures are:

- a) the military equipment/brigade maintenance section;
- b) the maintenance platoons/battalions.

The commanding and execution structures are dimensioned, at all hierarchical levels of the mechanised infantry brigade, taking into consideration the correlation with their missions, competencies and responsibilities.

In the case of the mechanised infantry brigade, during the development of the united military operations, the maintenance section and its subunits, in relation to the echelon that contains it, activates near the technical observance points, on evacuation-repair axes, on evacuation itineraries, in districts, gathering or concentration spots belonging to the units and subunits/of the deteriorated equipment.

The places of the deteriorated equipments are not usually places in protected areas – reservations, national parks, archaeological sites.

In crisis situations or in time of war, with the help of the local public administration and of the economical operators, mineral resources and human resources that are available in the responsibility zone can be used in maintenance works, according to law.

The economical units which are not included in the mobilising plans, but which in crisis situations or during war are to be used, can receive, with the help of logistic factors and structures having endowment and mobilisation attributes, technical documentation and minimum number specialised staff, tools, gadgets, spare parts and specific materials.

The maintenance uses engineering staff and technical staff. Within the engineering staff, there are officers and the civilian contractual staff, engineers. The technical staff includes the arms officers, military formen, non-commissioned officers, soldiers/professional sergeants and the qualified contractual civilian staff.

The planning of equipments is influenced by three factors⁹:

- the evolution and complexity of the equipments;
- the level of the professional performances of the technical and engineering staff when interacting with the equipment;
- the evolution and complexity of the technical testing and diagnosing systems;
- the leading and execution of maintenance activities.

The commander of the military brigade/battalion/subunit bears the entire responsibility for maintaining the functionality/availability of the endowment equipment.

The commander of the military brigade/battalion/subunit is obligated to ensure the forces, time and necessary means to realise the maintenance works completely and within the planned deadlines, according to the regulations in force. Also, he sets the regulations in order

⁸ Minculete, Gheorghe; Mocanu, Bixi-Pompiliu; Andronic, Benone, *Sprrijinul logistic al operațiilor unei unități de infanterie-curs universitar*, Editura Universității Naționale de Apărare Carol I, București, 2015, p. 77.

⁹ SMG/L-1 *Doctrina logisticii operațiilor întrunite*, București, 2008, p. 61.

to receive data and create the necessary conditions to ensure the security of the staff and of the equipments against the enemy's actions and other disturbing factors.

The chief of the logistical structure coordinates the activity of the command/execution structures of the subordinated maintenance through the technical deputy.

The staff that represents the leading structures of the maintenance and the maintenance execution structures has to know from peace time the organising and execution of the maintenance in crisis situations and in the case of war, in order to lead this activity and to permanently ensure a high degree of equipment functionality.

2.2. Maintenance of military equipment according to the type of joint operation deployed

The mechanised infantry brigade can develop the following types of operations: defence, offensive, displacement, transport, stationing, regrouping, replacement and missions in theatres of operations.

During the development of the united operations, the equipment maintenance bears some characteristics that implicitly influences also its planning process, as follows:

Maintenance in the *defence* operation is influenced by:

- the important losses a result of the concentrated use of air hits, missiles and, eventually, of the CBRN methods and incendiaries, as well as air drop actions, air-land troops and the scout-diversion groups;
- the large number of evacuated equipment, the relatively short time had at your disposal as a result of the enemy's advancing and the long distances on which the evacuation needs to be made in order to prevent the capturing and destruction of the equipment;
- hitting some production capacities, as well as some warehouses, partially or totally disabling them;
- temporary disorganisation of the communication network;
- the need of time for mobilisation, movement, the accomplishment of a number of stable defence works, as well as for the passing of the national economy at defence production;
- temporary occupation of a part of the territory and the evacuation of a number of production capacities, as well as a part of the population;
- difficulties in the movement of the troops, especially of the evacuations, due to the great number of refugees who crowd the communication lines.

Moving towards defence from direct contact with the enemy, under its high pressure, imposes the logistic structures to take the following measures in parallel with the ongoing combat actions and the realisation of the defence measures:

- a) the reassurance or support of the military units/subunits of the immediate engage forces, especially those from the main access denied directions, with structures of maintenance execution;
- b) assuring the takeover of the deteriorated equipments which cannot be mended at the spot, especially from the threatened directions;
- c) the arrangement of the maintenance execution structures so as, in the case of the enemy's penetration with defence, to ensure the time needed both for gathering and movement of the mobile workshops and for evacuating the deteriorated equipment;
- d) the execution of sensible manoeuvres with maintenance execution structures, with the purpose of handling the complex situations that occur;
- e) performing equipment maintenance works at night, in formation, simultaneously with fulfilling combat actions;
- f) performing repairs on the spot of disablement, at night, sometimes simultaneously with performing the mission, in which time the combat equipments can fire/strike from striking positions already prepared.

Organising defence without having contact with the enemy offers more convenient conditions for performing maintenance activities and works, due to sufficient time had and long distance from the enemy. The logistic structures are able to plan and organise maintenance activities in good conditions, with the possibility of executing scouting missions, staff training, complete mine arrangement, managing, control, guidance of the subordinate echelons and link creating.

During defence, evacuation, evacuation-reparation groups or mixed groups to repair the prepared equipment are planned and organised, according to the commander's decision, him being able to support in a short period of time the troops from the assurance area, the ones from the main access denied main directions which present higher damages in their equipment, the ones executing counterattacks/counter-strikes, as well as for those hit by CBRN materials and incendiaries.

Evacuation, repair and mixed groups are given as backup/support to the units/subunits that operate in the assurance area. When composing these groups, the logistic structures take into consideration:

- a) the type and an quantity of equipment that exist in the assurance area;
- b) the number of success successive alignments organised and the distance between them;
- c) the depth of the assurance area;
- d) the value of the detachment that have been moved forward and of the scouting elements;
- e) the probable deteriorations;
- f) the nature of the field;
- g) the time of resistance within these alignments, estimated by the quarters.

The big units/subunits on the access denied main directions receive as backup/support forces and means of evacuation or evacuation-repair which operate in the areas of the respective echelons, execute the repairs on the spot where the equipments have been disabled or in coverings and evacuate those that surpass their own possibilities.

The majority of the forces and means of evacuation are concentrated on the directions that the enemy has broken through the defence formation. In this situation, only the works for the partial recovery of the propulsion and direction in order to quickly evacuate the deteriorated equipment and especially those that could be captured by the enemy are operated. In order to operate counter-strike/counterattacks, the units are reinforced with structures which operate maintenance, which's value is established according to the echelon that executes the mission and its depth and also according to the existent situation, the category of equipments and the field characteristics.

In the case of being hit with CBRN or incendiaries, the logistic structures send recovery troops within the salvation-recovery detachments in order to extract the equipments and the operators from the contaminated districts/spots and evacuate them in a district/spot which offers conditions both for operating decontamination and for operating maintenance.

During the planning and operating of defence, the evacuation structures may be fractioned, according to each case, on subunits allocated as follows:

- a) for the reassurance/support of the units/subunits within the forces of immediate engagement, especially the ones from the main access denied directions or for those that cannot operate all the evacuations using organic means;
- b) assuring a number of key points, when the troops are in movement, through interventions in special situations;
- c) for the manoeuvre within the districts/gathering places of the deteriorated equipments or in the embarking-debarking spots;
- d) within the saving-evacuating detachments in order to extract the equipments and crew out of the contaminated districts.

The maintenance structures within the structure of the brigade, as well as those received for backup can be fractioned into mixed evacuation and repair subunits, according to the number of districts/spots of gathering of the organised deteriorated equipment and of the

units/subunits within the immediate engage forces, especially the ones from the main access denied directions.

The maintenance of the deteriorated equipment during defence is planned according to the operative/tactical situation, time needed, the quantity of disabled equipment, the repair needs and the productive capacities of the maintenance execution structures from the organisation, received as support/backup or from the economical operators.

The maintenance execution structures at the level of maintenance section-military equipments can be fractioned according to needs in order to support the units to execute technical maintenance and current repairs, on the spot where the equipments are disabled, in coverings, on the movement itineraries or in the districts/spots where the deteriorated equipments are gathered. In some situations, when there is enough time and all of the current maintenances and repairs have been made, the mobile workshops of the mechanised infantry brigade are able to execute also the medium operations in the districts/spots where the deteriorated equipments are gathered, with the assurance of necessary part and materials.

Small current repairs are planned during the preparation period of the defence operation, on the disabling spot, and during the operation, in the nearby coverings, for the subunits within the forces of immediate engaging or on the spot of disabling, for the rest of the subunits.

The deteriorated equipments, which have a medium level of repairs that need to be operated and surpass the brigade's possibilities and those that require high level repairs are handed over to the superior echelons. This operation is made at the districts/spots where the deteriorated equipments of the subordinated units/subunits are gathered, on the evacuation-repair axes of the brigade or from the districts/spots, railway station specified in the logistic orders.

Maintenance in the *offensive* operation is characterised by:

- a) the large resource consume and the decrease of the time in which technical maintenance is made, as a result of the wide force and means manoeuvres and from a direction to another, the continuous and intense usage of equipments;
- b) the operation of most of the maintenance activities during the night;
- c) the impossibility of complete technical scouting;
- d) the evacuation of the equipments on large spaces, on destroyed communication lines or not easily accessible, with various obstacles;
- e) the necessity of enabling a large number of deteriorated means;
- f) the necessity of fractioning the maintenance operating structures, as a result of the needs imposed by the operative/tactical situation, the field's portioning, the existence of areas in which hydro amelioration works are being done and, sometimes, the large widening of the offensive area;
- g) the possibility of totally or partially disabling a number of maintenance structures, as a result of the enemy's actions;
- h) the difficulty of the maintenance structures' work in the liberated territory due to the destructions made by the enemy;
- i) the possibility of using captures such as: equipments, spare parts, materials and fuels-lubricants.

According to the operative/tactical situation and the time had, during the offensive preparation the logistic structures take measures in order to ensure equipment maintenance taking into account:

- the execution of technical maintenance with the largest amount of work, corresponsive to the earlier consumes and to the one necessary for fulfilling the combat mission; when time is short, the main maintenance work are operated, with emphasis on the checking-over and adjusting the armament and the observation and aiming devices on combat equipments;
- the checking-over and, in need, completion of the materials with the material necessary for increasing the passing capacity and of night vision gadgets;

- the evacuation and repair in a short period of time of the deteriorated equipments in order to give the possibility to enable a large number of equipments during the offensive, thus increasing the troops' combat capacity. In general, the maintenance execution structures operate in the districts/spots where the deteriorated equipment is gathered. The number of districts/spots in which the deteriorated equipment on collected is established according to the evacuation-repair axes.

When the field/area, degree of deterioration or the importance of the equipments do not permit its evacuation in the districts/sport where the deteriorated equipments are collected, maintenance structures are sent, or modules within them, at the spot where it was disabled.

In some situations, with the commander's approval, some repair works may continue in the old maintenance zone until de movement in the next area:

- organising a number of evacuation, repair or mixed groups which are able to step in when ordered to help the subordinated echelons on the main offensive direction, the ones belonging to the immediate engage forces, that managed to break the enemy's defence line and which participate to the rejection of counter-strikes/counterattacks, as well as those badly hit by the enemy.

In order to plan as realistically as possible equipment maintenance, during the offensive preparation, the chief of the logistic structure studies in detail, on the map, the field within the offensive area and, according to the situation and possibilities, performs scouting in order to establish:

- the characteristics of the movements itineraries and the medium speeds that can be reached on them, for each equipment category;
- the necessary arrangements at key points, as well as the their technical assistance;
- the evacuation-repair axes;
- the districts/spots where the deteriorated equipment is gathered, main and reserve;
- the necessary evacuations means;
- the forces and the means of the economical operators existing within the area which can be used in maintenance.

In order to carry on the offensive, the units plan maintenance according to the actions' characteristics, the field's portioning, the amount of forces and maintenance means put at disposal and the possibility of their use.

The movement of the troops represents the action held in order to displace from one district to another, enter combat and performing manoeuvre. The movement has to be done quick, dispersed and subversive, in order to ensure the protection of the troops against the enemy's hits.

The main procedure of movement is the march which, according to the emergency of the situation, the effort demanded by the staff and speed, may be normal or forced.

Regardless of the procedure used, planning maintenance during movement needs to take all the measures in order to assure that troops get to the established district/alignment, in time and at the planned combat capacity.

Planning maintenance measures during the march, in stations, in the resting districts, as well as in the new district/spot in which the brigade/battalion/subunit settles depends in general on:

- the type of march and the time had for its preparation and execution;
- the movement distance and the probable resource consume;
- the probability of encountering the enemy or the use of high precision long range weapons by the enemy;
- the state of communication lines on which the march is executed;
- the possibility of using productive capacities belonging to the economic operators;
- the weather conditions in which the march is prepared and executed;
- the mission that needs to be fulfilled after the march is finished.

During maintenance planning, in general, the immediate engage forces have priority and especially those on the main direction of action, where encountering the enemy is possible or the ones which will undergo independent actions.

In some situations, when the time for march preparation is short, only a part of the maintenance operations can be planned, their finalisation occurring during the stops or in the resting districts/spots. During the first emergency, the works that directly influence the safety of the equipments' functioning are the ones executed.

With the approval of the commander, at the proposal of the logistic structure chief, some maintenance works, which are in progress, can continue in the same place following the start of the march.

After they have been finished, the respective equipments and the mobile workshops displace after the lines. Their framing within march lines of their belonging echelons as made during stationing.

During the march, the following activities are planned:

- the technical support for movement military convoy through key points;
- extracting the immobilised equipments outside the communication lines;
- technical evaluations, maintenance and repair works of small malfunctions;
- during long stops and in the resting districts, the completion with fuels-lubricants, special liquids, spare parts and materials is also executed;
- the repair of the deteriorated equipments surpass their own mending possibilities, their concentration and handing over to the superior echelon.

In the key points, the maintenance groups are sent before the lines, within the movement assurance detachment.

In certain situations, especially in the case of the long distance march, a group may be destined for maintenance in several points. The movement of this group, after the military convoy from the first points has been assured, is made in the back of the line and its passing in order to reach the next point shall be done during the stops.

In the small stations, the operators of the equipments will operate technical evaluations. During long stops, the technical maintenances interrupted at the beginning of the march are continued, the planned works are executed and the fuel-lubricants completions, special liquids, spare parts and materials.

During the stops, in the districts/day resting spots and night resting spots, the technical evaluation is prepared and, if it's the case, the strictly necessary technical maintenance works, with support from the maintenance structure constructors and/or from the economic operators in the area. The commanders will assure the maintenance staff minimum 6 hours of sleep per day.

The immobilised equipments, which block the movement of military convoy, are evacuated as first emergency. In this case, they cannot be mended on the spot, their towing will be made, in general, forward, until the nearest spot in which the deteriorated equipments, organised by the superior echelon.

During the march, especially the forced march, the maintenance of the movement military convoy from an echelon are organised by the superior echelon with its means. On the march itineraries, the units and the big tactical units do not organise a district/spot where the deteriorated equipment is gathered. The echelon superior to the one executing the march takes over the fond that needs repairs from the ordered points and executes the necessary maintenance works.

When the superior echelon does not assure the line's maintenance during the march, measures are taken in order to ensure the movement the military convoy through the mandatory passing points, adequate forces and means being sent in the front of the line. In this situation, measures for a efficient use of the economic operators in the area, according to law, take place.

The maintenance groups move in the march line, before the service formation and engage only in repairs that take until one hour, on the spot where the functioning equipments are disabled. The equipments which require a high volume of works are towed, if the necessary means are present, or they are pulled out of the communication line and are handed over to the evacuation structures of the superior echelon.

The movement of the maintenance execution structures, at companion/battalion level, is made united when the march is executed on only one itinerary, or fractioned when the march is executed on more than one itinerary. Fractioning is made taking into consideration the particularities of the military units/subunits on the move.

In the march line, the maintenance execution structures move behind the main forces and in front of the military units/subunits and the service formations.

At the companion level, the maintenance execution structures operate current repairs that last for 1-2 hours, without unfolding for work. The battalion maintenance execution structures operate, according to the time they have at their disposal, on a part of the regular repairs, execute the other medium and regular repairs in the new district/spot.

The repartition of the subunits within the maintenance execution structures, at battalion level, is made according with the time of the march itinerary, with the forces and means given as support by the superior echelon and type of equipments within the composition of the lines.

The facilities of evacuation within the mechanised infantry brigade take over the deteriorated of the subordinate echelons, from the districts specified within logistic orders.

The stationing time of the maintenance execution structures in stations, districts/resting spots or in districts/concentration spots is generally equal with the stationing times of the troops and their movement is made together with lines of the echelons where they belong, in case they did not receive other missions within the maintenance missions during the march.

Maintenance during the *transportation* of the troops encompassed the entire measures which take place for the training of the staff, preparing equipments, moving into the waiting districts, embarking, the actual transportation, disembarking and the movement into the new area.

When planning maintenance, the following elements are to be taken into consideration:

- the composition of the transport echelons;
- the march formation from the gathering/concentration district towards the embarking spots;
- the optimal crowding itineraries towards the embarking spots and from the disembarking spots towards the new gathering/concentration districts, as well as the mine disposal measures and the ones organising maintenance within these itineraries;
- the embarking and disembarking spots of different echelons, the number of platforms, access routes, waiting spots, the masking conditions;
- the arrangement of the head and side platforms, as well as the assurance of the materials and gadgets necessary for embarking and securing the equipments;
- the special completions and arrangements necessary for equipments, in order to transport them on heavy tonnage trailers, by train, sea, river and air;
- the measures regarding transportation and the watch over the oversized equipments;
- maintenance works execution, with the purpose of assuring a continuous functionality until the mission that follows transportation is fulfilled;
- preparing the necessary materials for securing the equipments on the transportation machine;
- verifying and completing the masking resources;
- disassembling the exterior elements of the equipment, that surpass the maximum admitted tonnage for transportation on car roads, by train, sea, river and air;
- taking the appropriate measures to prevent deterioration from frost;

When movements do not take place and when there is no combat, the troops are *stationed*.

The purpose of stationing is to ensure the troops conditions for preparing combat actions, marches and to restore combat capacity.

When stationed, the maintenance execution structures are organised within districts/gathering/concentration spots, regrouping, wait, embarking, which should assure protection against CBRN or incendiaries, the enemy's air actions and against the scouting-diversion groups, as well as the fast execution of manoeuvre.

Maintenance during troops stationing has as its main goal taking all the necessary measures for re-establishing functionality for the missions that are to come.

When the troops are stationing, the districts/spots where the deteriorated equipment is gathered are usually places in the centre, as to reduce at the minimum the evacuation distance of the heavy equipments, or where most of the equipment that needs repairs is not concentrated in.

In the situation in which the entire material that need repair is places along the entire surface of the district in which the troops are stationed, the technical assistance is distributed through concentrating the deteriorated equipment into the districts/spots where the deteriorated equipment is gathered, or by fractioning the maintenance execution structures and sending them to support the subordinated echelons, in order to execute works at the spot of disablement.

When organising maintenance during stationing in localities, the possibility of executing a number of works using the production materials of the economical operators in the area is taken into consideration.

The management of maintenance execution structures is made through logistic support orders sent through personal contact, using wire, mobile or signalling communication methods.

Maintenance during troop *regrouping* contains the measures and activities operated with the purpose of creating the necessary conditions to achieve new forces and means in order to pass to another form of combat/operation, in order to move the effort on another direction during the military operations, as well as to strengthen the existing forces.

Maintenance during troop regrouping is planned and organised similar to the movement and stationing of the troops, with some particularities depending on its realisation.

In the case of in depth regrouping, maintenance is organised for the movement of the troops from the subsequent engaging forces, reserves of all kind, battalions/subunits and service formations towards the new action districts.

When regrouping is executed along the front line, maintenance is organised for the movement of the troops from one sector of the front to another, of the subsequent engaging forces/reserves and weapon reserves or a part of the immediate engaging forces, corresponding to the mission received.

In the case of regrouping backwards, from the front, maintenance is organised for the movement of a part of the troops pulled out of the immediate engaging forces or for the subsequent movement of the engaging forces/reserves.

In the case of the regrouping of the in depth troops towards the front or coming from the front backwards, the maintenance forces and means of the own echelon are used, together with the ones received as backup.

On some directions, the brigade is able to set up technical assistance in key points, evacuation and re-enabling the deteriorated equipments having a work volume that surpasses 1-2 hours, in order to give the organic forces and means the possibility to move together with their echelon.

When the troops regroup along the front, there will be evacuation itineraries on the regrouping directions, on which maintenance execution structures belonging to the superior echelon will operate, with the purpose of providing technical assistance in key points, to evacuate and repair some categories of deteriorated equipments and to provide the taking over of those the are outgrown by the situation from the regrouping units.

When the troops are regrouping, the maintenance activities need to be planned and organised in shortest possible time and subversively, in the night or when visibility is very

low. Only in exceptional conditions, depending on the given situation, they will be performed in the day time.

During regrouping, maintenance needs to be planned, organised and lead as to maintain a high combat capacity in order to permit the troops to fulfil any combat mission, at any moment.

When the brigade/battalion regroups on a new direction on which other forces did not operate, the chief of the logistic structure prepares planning the maintenance of the equipments belonging to the detachment which has been moved forward or the one belonging to the tactical air drop.

After the brigade/battalion has reached the settled district/spot, maintenance is planned according to the received mission.

Replacement of the troops encompassed maintenance measures and activities planned both for the unit that is being replaced and for the one replacing it, so as to continue the combat actions. These are performed subversively, usually at night or when the visibility is low, as well as in the day time given by the commander.

During replacement and after, maintenance activities are performed by respecting the old work program both for the forces that are being replaced and for the ones that replace. In this matter, the chief of the logistic structure that replaces planes and organises maintenance usually in the ways of the military unit that is being replaced, using the same exes o recovery-repair, evacuation itineraries and districts/spots where the deteriorated equipment is gathered. If the unit that replaces has some different types of equipment from the military unit it has replaced, the corresponding masking measures will be taken.

In the districts/gathering spots destined to the military units/subunits that are replaced, as well as in the departing districts destined to the military units/subunits that replace, maintenance is planned similar as in the case of the stationing of the troops.

When preparing the replacement, the chief of the logistic structure that replaces will take the appropriate measures for completely performing technical maintenance; the evacuation and repair activities will intensify at the same time with handing over the equipments than need repairs which surpass their own possibilities, so as all the equipment to be functional at the start of replacement.

In exceptional cases and with the approval of the structure's commander, if by the start of the replacement that are in the last phase of repair, a part of their own forces and means will remain to finish the work and will subsequently move towards the district/gathering place.

Before starting replacement, the logistic chief of the structure that replaces, together with the one that is being replaced, performs the scouting of the evacuation-repair axes, the evacuation itineraries, the districts/spots in which the deteriorated equipment is gathered, the productive capacities of the economic operators.

At the same time, there are a number of things that are noted: the hour and type of replacement of the forces and means that work in the districts/spots where the deteriorated equipments are gathered, guides assurance, organising links, the terms and the ways in which the commanders and the chiefs of the subordinated maintenance structures worked together, as well as the delivery-receiving document regarding the district.

In the *operations theatres*, maintenance activities in externalised system is planned and executed for the interoperable equipments through:

- a) technical protocols signed with the leader nation/nation that has a special role;
- b) technical bilateral agreements signed with nations that participate in international missions;
- c) technical agreements signed with the host nation;
- d) the NATO Maintenance and Supply Agency, on the basis of the status own by Romania as a NATO member;
- e) contracts with the economical operators that exist with the operating theatres;

- f) contracts signed with the internal economic operators;
- g) specific procedures, established through NATO standards.

The Logistic directorate and the Legislation directorate coordinates the processes of elaboration, negotiation and signing of the technical agreements referred to letters a), b) and c), according to the responsibilities found within the regulations in force.

In the case of the non-interoperable equipments, the externalised maintenance is executed through the care of the Logistic Quarters and the Communication and Informatics Quarters which sign contracts with the national economic operators.

Planning the maintenance of the mechanised infantry brigade during the united military operations is represented by the establishment of the basic data which ensure the progress of the activities in the best conditions, as follows:

a) the stock that needs to be repaired, categorised on type of equipment and reparation needs, establishing the necessary and possible work volume that is possible to be performed according to competences. The total repair stock is obtained from the received logistic informing reports and for the mission that needs to be fulfilled it is obtained calculating the probable loses tacking into consideration combat and usage;

b) the place where the stock that needs to be repaired, the districts/spots in which the bigger loses can be deduced and the evacuation measures within maintenance execution structures;

c) the available production capacities and the possibility of their repair, taking into consideration the existent situation and the technical state of the organic forces and means of reparation received as backup/support, the degree of providing aggregates, spare part and materials, time conditions, seasons and weather conditions;

d) the production targets and the mission of the maintenance execution structures during the military operations, their repartition and manoeuvre;

e) the preparing activities, as to hand over the deteriorated equipments, which cannot be repaired with their own means, to a superior echelon;

f) the districts/spots where the deteriorated equipments are gathered and the periods of time in which the maintenance execution structures carry on their activity;

g) the way in which the informational flow for the transmission of logistic orders to the maintenance execution structure is realised and receiving their logistic reports.

Within the joint operations, the order and the urgency of performing repairs is established by the technical deputy, having the decision of the commander at its base, the dispositions given by the chief of the logistic structure, the technical status and the mission of the subordinate echelons and is communicated to the chief of the maintenance execution structure, through logistic orders.

Planning the volume of technical maintenance works during the preparation and progress of the united military operation is established according to the available time, the situation of own troops, the technical state, rendition, functioning hours, the number of hits since the last technical maintenance and the probable consume of necessary resources necessary to execute the mission, the depth of the missions and the type of combat, districts/the places in which the military units/subunits enter/exit after fulfilling their mission and the time spent in them, the forces and means that can be used, the field on which the combat actions take place, time, season and weather conditions.

Conclusion

Maintenance can be based on the capabilities of the specialised structures and on the opportunities offered by the geographical space in which the united military operations are executed. In its turn, maintenance has valences that give it complexity, especially in the tactical field.

This complexity results especially in the case of assuring combat technique maintenance, an essential landmark for fulfilling the missions. Technical evacuation represents a real challenge

for the maintenance structures, being influenced by field, weather conditions, and especially tactical background. For sure, technical evacuation will not be fully realised, especially in the case of the operations where the fighting forces (regardless of their type: manoeuvre, combat support or logistic support) loses ground to the enemy (in the case of defence, regrouping or retreat), a case in which the military technique that cannot be evacuated will be deliberately destroyed, in order for it to not be captured by the enemy.

The whole range of activities of maintenance implies heavy aggregate and subset handling, fuel consume, spare parts, expandable, time, effort made by the staff of the maintenance execution structures. In order for their activity to be as efficient and opportune as possible, it is necessary that they be judiciously distributed and disposed in the logistic responsibility area.

The maintenance measures taken within the united military operations need to ensure the fulfilment of the troops' missions, the evacuation of the immobilised equipments, most importantly of the one threatened to be destroyed or captured by the enemy and their repair as soon as possible, in order for them to be re-introduced in combat.

Planning the maintenance for the equipments belonging to the mechanised infantry brigade within the united operations needs to fulfil the conditions required in order to deploy the entire range of command, together with his functions: foresight, planning, organising, governance and control.

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THE INTERNAL FACTS WHICH HAVE A MAJOR INFLUENCE ON TACTICAL LOGISTIC STRUCTURES

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Abstract:

Tactical logistic structures were developed to be part of Logistic System of the Romanian Armed Forces (SLIAR) and to be able to respect all the logistic support principles in activities and missions. Beyond the external agents such as geopolitical, geographical, economic and social environment, which also have a major impact on the entire armed forces, there are many others. In this paper, we decided to talk about a some of them: the served units features, their missions, technical and tactical armament features, fight types, the measure of maneuvers and particular training activities. We admitted that all of them have a main impact on the logistics units. The common features of the logistics units make the system working together and give the meaning of the integrated logistics system.

Keywords:*The Logistics; influence; tactic.*

Introduction

The entire process of redefining the military concepts have generated changes and deeply adjustment needs. It is known that army is an attractive domain and civilians and military are interested in it in a similar way. The upgrades, the acquisitions or the high-performance armament could not be unnoticed. However, we could ask ourselves, why the logistics was not recognized as a science even if it had existed for hundreds of years. As history shows us, in the absence of the major tactical errors, in the lack of surprise achievement or in the absence of traps or betrayals, some great world leaders like Alexander the Great, Napoleon Bonaparte Gingham, Michael the Brave and others were also very good managers of spaces and resources. As we know, a significant part of the individual logistic support was done by the fighters themselves. The fights in which were only white weapons were used did not need the ammunition resupplying and, in many cases, the individual rations of food for units were taken by themselves at the conscription time. The great leaders gave logistics a meaning and used its principals in the military actions. The Romans used the word „logiste” or „logista” for the first time which meant the officer who was charged with the war goods supplying. At the same time, in the different places of the world and in the different periods of time, we can find the real armies which were paid and trained to be able to react in the conflicts or to be used to react in case of necessity. All the goods and means needed to be used in the war were given by every soldier.

In “The Art of War” written by Niccolo Machiavelli, we find a whole debate on the advantages and disadvantages of this approach which cannot become reality in our days.

Gradually, the military conflicts evolution forced the mankind to study the laws and the principles which ruled the high-performance logistics. The studies showed that logistics was a well-defined profession and in the Golf War they demonstrated that the proper ratio of logisticians

to a fighter was 3:1. In the last century the World Wars, the Cold War and the local conflicts caused many changes and reorganizations of the army forces and the logistical structures.

At this moment, the Romanian Army gets through many changes and upgrades. All the logistical structures are being adjusted according to those changes. We think that the result of this process is influenced by many factors, some of which are political and economical. These two factors have had an overwhelming axiomatic significance. The time between now and the last classical war, which took place in the Middle East, is pretty short. In this context, we are tempted to diligently study the military operations between the regular armies which are characterized by delimited fronts, the well-defined enemy structures and the last generation means of war and armament.

In this geographical space, a large variety of violence having different degrees of intensity can be seen. The existent aggression and the unconventional areas imprint their effects on the conflict physiognomy. Considering the recent offensives against the Islamic State to study the classic war and to train the army to be able to play in remains a good idea. Many countries are making themselves ready for a hypothetical classic war even if many other types of war are known and even they take place in a large variety of areas. These countries are buying armament and equipment knowing that many of their acquisitions fit just for a classic war.

The crime, the mass media manipulation, the intercommunity violence, the terrorism, the uncertainty about clearly defining the enemy are states of facts which can be seen in hot places in the world like Afghanistan (Pashtun Taliban Insurgency), Brazil (Favela War), the Central African Republic, Congo, Iraq, Libya, Mali, Nigeria, Pakistan, Somalia, Syria, Thailand, Yemen (civil wars and counterinsurgency), Mexico (the war generated by the drugs traffic), the North Korea (the sudden increase of the mass-destructions armament) and in the long conflicts around the Black Sea¹.

The hot geopolitical context is boosted by a technological evolution never known before. The organizations have the opportunity to develop real informational networks using just a few financial resources. The states of the world are doing their best to improve their defense capabilities.

The North Atlantic military structures are influenced by a large variety of challenges which take place in the geopolitical and geostrategic context. In these challenging atmosphere the Romanian Army has many objectives but some of them have to be priority. Troops training, joint exercises, projection and planification of a support unit capable to fulfil complex missions in different conditions are some of the main goals. Together with the fighting forces and the support forces the tactical logistical structures must also be able to deal with daily challenges generated by the dynamic of those logistical structures. The coherence, the competence, the firmness, the accuracy, the involvement are a few necessary features for any manager who leads the destiny of a logistics structure. Those leaders must always pay attention to general, social, economical, political, structural changes and, at the same time, they have to study continuously and act promptly, determined and legal.

The factors which influence the organization, the structure and the management of the logistical units at the tactical level

The present-day fighting area as a part of the operational environment has many different features in comparison with the old fighting spot. The new one has got new dimensions which overcame the common sense and the perceptible sphere. The multidimensional fighting space refers to the actions taking place in the common three-dimensional plan and also in the patterns like: informational, cybernetic, psychological, parapsychological and

¹ <https://www.globalsecurity.org/military/world/war/index.html>, accesat la data de 21 mai 2018.

radio-electronic. In the past, the most noticeable qualities for the successful military actions were: the fastness, the initiative, the convergence, the dynamism and the flexibility. In our days, to these already mentioned features we should add: the discontinuity (a spatial characteristic which refers to the forces spread out on a large territory with large gaps between the clusters), the automation, the digitization (a process of changing data into a digital form that can be easily read and processed by a computer) and the troops ability to put the impact systems in all the environment types. In these conditions, the establishment of the tactical level army forces is influenced by permanent adjustments. Unfortunately, the adapting process is not always promptly done.

The lack of readiness is the result of three main factors:

- The results of the scientific research and the learned lessons from the operational areas are not given properly to the command structures. In many cases, the military students find brilliant conclusions in their research. Mostly, these results are used just in case the explorer become a top leader. On the other hand, the learned lesson from the operational areas in which the Romanian Army participated are just written on papers and filed away in drawers. The staff from the command structures are not trained to conceive and promote the measures for changing the domain in a functional one.

- The slow and complicated bureaucratic rules make it impossible to change or reorganize any military domain;

- The lack of staff, the complexity of activities, the problems from the educational system, and the improper personnel politics generate delayed reactions in self-regulations of military system.

It is true that a huge step forward in the increasing professionalization of the army has been done. It is also known that the logistics has many objectives to perform. But, there are many aspects which were forgot or which have not been established yet. So, the study of the aspects which have to be improved is necessary and the solutions for the logistics problems are welcomed. On the other hand, the focus on the activities management can streamline the whole Romanian army logistical system.

According to the Romanian Joint Logistic Doctrine² the military logistics is defined as “the management science which attends to the planification, the coordination, the cooperation, the operation, the command and the control of all the material resources and necessary services for supporting forces along their missions in peacetime, in war or in crises situations. The Romanian Logistics represent a unitary ensemble of functional domains, activities, and specialized military structures which provide the material resources and necessary services for supporting forces along their specific missions.”³ The same legal framework defines the military logistical components and sorts them out into three groups: the output logistics, the support logistics (the main logistics), and the operational logistics (the consumer logistics). Concerning what it has just been mentioned, the article refers to the operational logistics, which is used by the infantry division or by the structures which are smaller than a division. Considering what was mentioned before logistical bases are the immobile elements which are not parts of the execution module of the logistical support but they are included in the main logistics. Likewise, the article speaks about the support logistics.

The infantry brigades, the mountain troops, the artillery, the NBS battalion, the communication and informatics battalion, the intelligence regiment are the engineer troops are directly subordinate to the infantry division headquarters. The mission, the organization, the number of personnel and the equipment of those military structures strongly influence all the logistical support elements.

² Doctrina Logisticii Întrunite a Armatei României, SMAp-38, București, 2018.

³ Idem, pct. 0127

The big units, the units and the logistical support subunits acting on the tactical level are responsible for “the planification, the coordination, the cooperation, the operation, the command and the control of all the material resources and necessary services for supporting forces along their missions” for their troops. These units are parts of the Romanian Integrated Logistics System. They include command logistical structures and execution logistical structures which abide by the national doctrines and laws, and also the NATO’s and UE’s system of rules. Under the framework, all these structures support the combat troops by giving them all the necessary products and services. It is known that the logistical support must be done in a gradual way. The support has to be adapted to the level of the fighting capacity of troops. It has to fulfill the conditions regarding the proportion of the dimension, to maintain and sustain the fighting troops liberty of moving, to make sure that the command-control system works, to adapt the equipment for the sustained structures, to maintain the equipment in well conditions and to ensure that all support services are able to do their jobs at best performance conditions.

Inasmuch, the logistical system of the infantry division constitutes a part of the Romanian Integrated Logistics System and it works at the tactical level. Thus, we will enumerate the main units subordinated to the division headquarter. For each of these we will mention their logistical support but we will not say anything about their missions:

- One to three infantry mechanized brigades / one mountain brigade - each of them subordinates some infantry battalions / a mountain battalions, a tanks battalion, one artillery battalion and one air defense battalion. According to the missions, the organization of the brigade can have different elements. Likewise, the brigade has some companies designated to support the headquarter. The associate logistical support is done by the logistical support battalion and by the support companies. These companies have fighting support plutons and logistical support plutons such as: the maintenance pluton, the supply pluton and the transport pluton. Every battalion has a medical unit. A point of interest is represented by the horse company of the mountain brigade. This structure is used for the transport people and goods sustaining the fighting troops.

- An artillery regiment composed of artillery battalions and a few subunits which support the headquarter. The associate logistical support is done by the logistical battalion when the fighting battalions work together in a joint way and by specialized support companies when the fighting battalions work by themselves;

- An artillery regiment made up of a few battalions and some headquarter subunits. The associate logistical support is done by the logistical battalion when the fighting battalions work together in a joint way and by specialized support companies when the fighting battalions work by themselves;

- An intelligence regiment made up of companies. Its logistical support is done by the support company;

- An engineer battalion structured into companies. Its logistical support is done by the support company;

- A signal battalion which is lined up behind by the support company and a CBRN battalion also upheld by the support company.

In order to accomplish the entire tactical logistical support, a few logistical structures were designed. These were created to complete the first and the second logistical support lines in war and to do the logistical support in peaceful situations:

- The logistics brigade is a big logistical support. It provides the necessary goods and services which cannot be supported by the structures mentioned before. Thus, the logistics brigade is partly a component of the operational logistics and its static element which cannot be moved are parts of the main logistics. The distinctive elements of the logistics brigade are connected with the logistical support element of the tactical units. Their general missions are:

- The maintenance unit has in its subordination a few maintenance departments for military equipment. The number of departments is the same as the number of the brigades subordinated to the infantry division. The role of this unit is to do the equipment maintenance of the infantry division by using the maintenance specialized structures or by using specialized acquisition services. In the theatre of war, the maintenance unit will represent the mobile maintenance and evacuation department. It will have superior capacity and it will act on the second logistical support line. At the same time, the logistical elements which cannot be easily deployed act on the third logistical support line, in the main logistics respectively.

- The Quarters of Troops and Post Administration Center is the logistical unit specialized in constructions and accommodation. It has just a few deployable elements and usually acts in peacetime. The Quarters of Troops and Post Administration Center makes the maintenance and the urban renewal of all the facilities necessary for the troops instruction and recovery. In the peacetime, the other logistical structures are responsible for providing the necessary materials and services and The Quarters of Troops and Post Administration Center is responsible for making the estimates and assigning the contracts for the constructions.

- The specialized depots for different kind of stocks ensure the receipt, the storage, the keeping and the distribution of all the goods and the equipment elements necessary for making the stocks, training the troops, and filling up the tactical network storage.

- The transport battalion is the main carrying unit specialized for making the links between the elements of SLIAR at the tactical level, at the consumer logistics respectively. This battalion is structured into specialized classes of goods companies. It has a suitable mobility for the second logistical support line, for the brigade department respectively.

- The support battalion of the infantry division is the unit which supports the headquarters. It fills up the short supply but it is not an exclusive support structure. In the peacetime, the support battalion has to provide the goods and services for all the battalions directly subordinated to the infantry division. In the war, sometimes there are some misunderstandings of the support battalion missions and the commanders entrust not clearly defined tasks to the support battalion. It is known that the battalion has limited competences. The support battalion does not have three transport companies like the logistical battalions, the support battalion cannot ensure the logistical support for the battalions directly subordinated of the infantry division. It is the logistical brigade that has to do this support.

The logistical structures just mentioned are connected to each other by logistical links. These connections are necessary for the troop's trainings and for the mission's execution. The logistical units are structured into the logistical command structures and the logistical executions structures. All of them have to act within the same national legal framework and they have to abide by NATO's and UE's rules. All the functional logistical joint domains have to act under this framework and they have to ensure the necessary goods and services properly.

The particularity of logistical structure mentioned before is their specialization in a particular area of activity. This specialization is directly connected with the supported structures. Inasmuch, the maintenance unit has trucks, tractors, vehicle workshops, machineries, tools, kits, and different accessories for all the technical domains (truck, tanks, artillery, CBRN, and others). The logistical support battalions and the support companies are dimensioned and assigned for properly ensure the designated brigade or battalion. The logistical brigade depots permanently adapt their stocks and they are influenced by the missions changing or by the fighting and sustaining conception of the infantry division. We can easily see that the changes of the fighting units affect the logistical structure. For example, all the changes which took place in the signal battalion affected their associated logistical support structure. Their maintenance platoon developed and specialized for doing the maintenance of the modern technology (radio stations, command and control deployable technical module, servers and networks, and others.)

The personnel training influences the support logistical structures, the personnel competence affects the supported troops achievements, the performance levels, the existence or nonexistence damages, the efficiency of planification and the performance of the logistical operations leading and, the security of the troops. Aristotel said that “we are what we are repentantly doing, because of that the mastery is not an act, it is a skill. The logistics by itself cannot win a war, but its absence or its wrong usage can cause the defeat.”⁴

On the tactical level, the logistical support sustains the headquarters abilities. It makes them capable of fighting involved totally. An efficient logistical support gives an appropriate assistance to all the forces of the in operational area, at proper moment. The logistical support must concentrate on:

- the accommodation (providing food and places to live, services for bath taking and laundry, waste disposal, mail services, moral welfare and recreation services, and funeral services),
- the necessary maintenance on the battle field,
- the stocks supply,
- the means and forces deploying,
- finding the necessary logistical support needs,
- the medical services.

Both the logistical schools and their leaders must pursue best qualities for a logistician. A good manager who leads logistical structures must have the ability to predict what is likely to happen and he has to use this to be prepared for the future. He has to be able to conceive successful and coherent logistical plans, and to deeply understand the military actions. This logistician must know how to work together with officers from the other forces or with officers from the supported structures. He must react promptly and support the fighting troops all the time.

The logistical system of the infantry division is “structured into the planification and leading logistical units, the informational logistical system, logistical support units, and materials stocks designated for tactical troops.”⁵ On the other hand, the planification, the organization, the exercises, and the trainings depend on the level of the personnel training. The coordination and the timing are essential too. Without these elements we are never sure about the victory.

The leaders and the execution personnel must lead and organize all the activities in a well-balanced way to achieve the self-sustainability of the tactical structures. They must observe the timing and plan the activities in the best way. It is known that the logistical activity does not have breaks. Sometimes it has a low intensity but it does not stop or rest. On the other hand, the logistical personnel career must follow the General career guide. They must train in the military training institutions and they have to follow the initial course and then the higher professional forming career. We think that the logistical personnel wanting to become better leaders should have qualities such as: self-esteem, flexibility, sense of honor, morality, integrity, loyalty, trust, authority, and discipline. Some of the rules must be changed: the possibility of giving up the logistics and go into other branches has to be limited. Sometimes, the branch changing was a solution for the lack of personnel. The militaries whom changed their branches and became logistical personnel proved that they could perform in this new branch. Sometimes they showed a higher level of understanding but they were not able to anticipate, to react promptly and to do their best in this area of knowledge. This kind of personnel would never achieve the expert level of training. It is important to identify the necessary skills for a logistician and it has to do everything it needs to get them. There has to

⁴ Col. prof. univ. dr. Gheorghe Minculete, col. (r) prof. univ. dr. Benone Andronic, *Sprijinul logistic al operației ofensive a brigăzii mecanizate*, Editura UNAp, București, 2010.

⁵ *Idem*.

be a well-defined forward projection of a logistician career. We think that identifying this projection of the career helps the personnel understand what he has to do. The motivation for becoming a better logistician, the reason why somebody has to do his best show the leader his own weakness and help him to find a way to improve them. The discipline and the trust in his leading power make the leader motivation become persistent. Neumann E. and Reichel A.⁶ define the motivation persistence as “the individual skill which exceeded the obstacles and which persevere in finding solutions in spite of all the hostile circumstances.” Wise L.L.⁷ says that “the motivation persistence is the capacity of resistance in spite of giving up temptation when the sustained effort is needed”. Beyond the inherent qualities of the individual personality, the vocation, the emotional intelligence and other features, the motivation persistence is a main function in achievement. This was had been demonstrated in 1908⁸ and was detailed in different studies later.

The efficient application of the managerial functions on the tactical logistical structures is the last problem we want to write about. The organizational management was defined with just a few years before. The influence between the organizational management and the military phenomena is obvious. Both domains admitted that the intuition and the charisma have a great influence on the military operations. On the other hand, the theories, the knowledge, the concepts, the principals and the technics of the management science have had a major influence on the logistical and military organization development and evolution. The logistical functional domains were defined as having implications in management. The logistical doctrine defines all of the next concepts such as individual domains: the material resources management, the services management, the NSIP management, the HNS and RSOM management.

On the other hand, some of the military concepts are also used in the management science: technics, strategies, operational management and others. The combination of the military theory and management have given performant leading approaches. It is said that “the management will allow the synergy of the informational, maintenance, transport, assistance, mechanisms to be able to answer immediately in crises or in the conflicts, to quickly follow and change the destination of the necessary goods and means, to deliver the equipment to the beneficiaries and to ensure the force sustenance in obtaining the success in the military actions⁹”. Using the management functions in the tactical logistical support is a wish of all motivated and well-prepared leader. On the other hand, this usage is a condition for success. Likewise, the logistical leaders must know the importance of the team work, the value of the commander example, and the worth of each soldier from the structure. The leader has to understand that the power of the team is easily influenced by the weaker part of the organization. He has to minimize the risks and to underline the positive results.

Conclusions

The logistics is the main element used to improve the quality of the military actions. It is known that the military actions have been diversified and their rapidity made the logistics become a performant domain. The logistical support involves important goods and significant human resources. The main mission of the associated logistical structures is to find solutions for all the tactical fighting forces logistical tasks.

⁶ Neumann Y., Finlay-Neumann E. and Reichel A *Determinants and consequences of students burnout in universities*, The Journal of Higher Education, 61 (1), 1990.

⁷ Wise L.L. *A persistence model of motivation and test performance*, the annual meeting of American Association of research in education, New York, 1996.

⁸ McDouglass W. *An introduction in social Psychology*, London 1908, apud Ticu Constantin, Ingrid Iarcuczewicz, Loredana Constatin, Anca Fodorea, Liliana Caldare, “The motivational persistence and its operationalization in assessment of the motivational potential”, The Alexandru Ioan Cuza University Annual, Iasi.

⁹ Col. Prof. dr. Gheorghe Minculete “The management elements of the logistical support”, UNAP, Bucharest, 2005, p. 7.

The results of researches showed that different domains influence the organization, the equipment and the usage of the logistical structure. These researches were based on the twenty-year experience in the base and sustain logistics. On the other hand, the number of personnel, the equipment, the organization, and the logistical forces training influence the supported troops. The logistical structures are not only the troops who bring the logistical support, but also be leaders in the logistical domain, guides and examples.

We all know that the daily logistics involves time, money and resources. But these daily activities cannot substitute the real training for the operational logistical support. We think that it is the time to improve it. The logistical structures must perform in bot the war and peacetime. They have to train and to adapt to the new technology and equipment. The lack of performance could have negative consequences.

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<http://www.globalsecurity.org/military/library/news>

BATTLEFIELD IDENTIFICATION FRIEND OR FOE SYSTEMS

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Abstract:

Identification Friend or Foe systems represent one of the most important control measures and force protection involved in any action. Such a system must be implemented up to the bottom level, sometimes as low as the individual soldier level, having as main objective avoiding fratricide.

Keywords: *Information; IFF (identification friend or foe); engage; enemy.*

INTRODUCTION

In any armed conflict fratricide has always been the concern of all parties involved. The number of the fratricide incidents has significantly dropped as armament systems have been developed, as techniques, tactics and procedures have become better and as knowledge and situational awareness (SA) on the battlefield have been optimized.

Nevertheless, fratricide is still a major threat for the troops that carry out operations on the battlefield. This phenomenon has become a factor of major strategic and operational impact that cannot be omitted in the current international environment. The development of the IFF systems on the battlefield is an essential component in preventing fratricide.

CONTENTS

Although doctrines for joint operations have been improved, although high performance data communications systems (TDL – Tactical Data Link) and battlefield identification systems (CID – Combat Identification System) have been developed, although instruction and training methods and procedures for the personnel taking part in military operations have been enhanced in order to prevent fratricide, human factors together with the speed and the non-linearity in leading combat operations will make it impossible to completely eliminate fratricide.

The information exchanged within the command, control, communications, computers, intelligence, surveillance and reconnaissance systems (C4ISR) represents specific information flows that are established inside the system and intend to, but are not limited to, opportunely discovering, recognizing, identifying, locating and inferring possible intentions of the targets or of other objectives or phenomena that are relevant to the scope of military actions (for example: ordnance; non-combatants; environment conditions; potential dangers for friendly forces etc.).

Providing communications and IT services, appropriate for each user or information community, at the right place and at the right moment, ensuring high stability, flexibility and security characteristics and performances with an efficient use of deployed resources and at an established quality level is the principal objective of the activity pertaining to the specialized communications and IT structures at every hierarchical level in the Romanian Armed Forces.

Battlefield identification is the process meant to obtain a precise depiction of an entity which has been detected by any means or action, so that real time decisions can be made based on highly accurate information, including decisions on engaging various weapon systems. The detected features must certify that the respective entity, person, object or phenomenon, is a friend, a foe or a neutral and they impose making a distinction between its

military or civilian nature, and determining its class, type, nationality or intention. The main objective of the identification is to amplify the knowledge regarding the real situation and to estimate the dangers and the risks on friendly forces, so that operational efficiency can be maximized, while fratricide and collateral damage are minimized. Battlefield identification can be briefly explained as the means through which military entities distinguish friendly and enemy elements during operations and it mainly comprises three elements: situational awareness (SA), target identification (TI) and tactics, techniques and procedures to combine the first two elements. Situational awareness means knowing and understanding the relations between the forces taking part in the operation, the status, their missions and intentions on the battlefield. Its main purpose is to increase the forces' operational efficiency. Target identification is the process meant to determine if a detected entity is a friend, a foe, or a neutral in order to protect the troops against the attacks of the allied forces and to initiate or not actions to destroy or neutralize the identified entity.

Identification can be classified both from the point of view of the operational environment: surface-to-surface, surface-to-air, air-to-air and air-to-surface, and from the point of view of the way the identification is executed: cooperative/active and non-cooperative/passive.

Joint operations involve land, naval and air forces that act on all levels, strategic, operative and tactical. This has determined the speedy development of the C4ISR systems and implicitly of one of their essential components, battlefield identification. The main surface-air and air-air identification systems used within the North Atlantic Organization are the Mark X, Mark XII and Mark XIIA Identification Friend or Foe (IFF) systems, compatible with modes 1, 2, 3/A, C, 4 and 5.

These systems are used by multiple weapon platforms (anti-aircraft capabilities, aircraft, warships), sensor systems (radars) and command and control systems. Secondary surveillance radars (SSR) are the civil equivalent of the military IFF systems and are used both by civilian and military organizations to identify and control their own air platforms by the air traffic providers and by the units that are responsible with making and interpreting the recognized air picture (RAP). Both IFF and SSR systems are considered critical air safety systems for air traffic control and for air command and control. Civil aviation authorities have taken the decision to go to SSR "S" (Select) mode to use the European air space, this having major implications on military platforms that do not have the possibility to use this mode. The Mk XII(A) (Mode 5) IFF system presents better performances than the previous Mk XII IFF system, having significant operational performances, by using a new identification mode, Mode 5. This ensures better security and enhanced capability and solves most of the deficiencies of the existing Mk XII IFF, including distortion of the answers and replications of close platforms.

The main operational benefits of the IFF Mode 5 systems are: their compatibility with the civil mode S (IFF Mode 5 has the capacity to interrogate, reply and interpret data in mode S); increased performances of the transponder, its ability not to be influenced by misinformation signals, by interferences with other interrogators and its high resistance to jamming; increased control over radio emissions; increased range performances; reduced variation effects of the intensity of radio signals (multipath fading); elimination of the distorted replies from nearby aircraft; increased capacity and work possibilities of the system; enhanced correlation of the IFF signals received from detected targets; increased data transmission capacity; increased performances in terms of transmitted/received data security; enhanced electromagnetic compatibility; reduced number of operations carried out by the operator.

In order to ensure interoperability and increased operational capabilities in the field of the systems that identify friend-neutral-foe, in Romania's Armed Forces they will integrate IFF Mark XIIA systems on high operability deployable land, air and naval platforms. Accurately locating and identifying the target at a surface-surface level are the essential elements to reducing fratricide.

Currently there is a special interest in improving and disseminating SA, especially through developing and accomplishing the interoperability of the FFT (Friendly Force Tracking) systems. SA and TI are achieved both by integrating FFT systems and by completing data using information provided by other equipment and systems, especially voice ones, from satellite tactical networks, by VHF/FM radio equipment and by different command and control networks. FFT represents the capability to monitor the precise location of one's own forces and of the allied forces that have such systems, in almost real time and to exercise command and control over these forces, if need may be. They have a GPS receiver, a transmitter and a computer/display that shows symbols of one's individual own forces and those of the allied units. In order to achieve the interoperability of the FFT systems a standard for the data/information transfer interface has been operationally validated. One of the priorities in the identification field is the development of the transfer system of the data collected/centralized by FFT systems by means of the multifunctional information distribution system, Link 16, in order to get the common operational image and to prevent fratricide. This service will be extended so as to transfer relevant FFT data to naval capabilities by means of the naval command and control system and to air capabilities by means of the air command and control system.

The main points of interest in the field of CID (SA and TI) include data and information exchange between compatible standardized systems and disseminating them in order to get the common operational image, the recognized air, land and naval picture, the combined data and information exchange, the target identification data exchange and the video data exchange.

It is well known that over time three simple questions regarding geographical location have been the essential factors in carrying out armed conflicts, both for commanding officers and for the forces involved:

- What is my position and the position of the unit I am part of?
- Where are my own forces and my allied forces?
- Where is the opponent and what is the best way for me to attack and defeat him?

Knowing and correctly interpreting the situation and precisely identifying the targets are essential factors in giving pertinent answers to these questions.

A workgroup for battlefield identification made up of representatives of four countries (France, Germany, Great Britain and the USA) has recommended that the battlefield identification technology that will be used in the future by all NATO member countries should be based upon an interrogation-reply concept in the 33-40 GHz Ka waveband.

The activity is going to be carried on by another workgroup that will issue a STANAG standard for NATO, that will establish the wave form and the encryption system that are to be used to develop the new identification systems.

The recommendation is inspired by the French Battlefield Identification Friend or Foe (BIFF) system, produced by Thomson CSF Communications and by the American one, called Battlefield Combat Identification System (BCIS), produced by TRW. Both are based on the preferred principle and use a common wave form that ensures their interoperability.

Two other systems have been evaluated, the German one, the ZEFF (Ziel Erkennung Freund/Feind), made by Siemens and the British one, known as MAGPIE (Malvern General Purpose Identification Equipment), designed in cooperation with DERA (Defense Evaluation and Research Agency) and GEC Marconi.

The ZEFF system is described as a hybrid interrogation-reply laser-radar system, while the MAGPIE system uses a continuous unidirectional low power 94 GHz frequency low interception wave station.

An analysis on costs and operational efficiency, carried out by a NATO workgroup, has showed that, due to a relatively low price, the MAGPIE system was second. The same

analysis has placed the French BIFF system as third and the BCIS and ZEFF systems have come in third and fourth positions. Nevertheless, at a governmental level, they diplomatically avoid trusting any rating.

During evaluation, the BIFF and BCIS systems have worked on the 38 GHz frequency, but this frequency will no longer be used, as a result of the requests of the commercial communications industry. For the future STANAG standard, another frequency within the 33-40 GHz range will be chosen.

Thomson-CSF has claimed that its BIFF system, known as DIC (Dispositif d'Identification au Combat) in French, has successfully been tried on the LECLERC tank, on the AMX 10 RC and on the VAB. A representative of the company has stated that the concept of the attachable autonomous transponder used by the BIFF system offers the best battlefield identification friend or foe solution, as it is light, small, as it requires no exterior connection to the vehicle and has no complementary devices, such as a GPS or a computer.

This way, transponders can be mounted on other platforms, thus reducing the number of items to be purchased.

The most expensive component of the system, the CIT (Combined interrogator-transponder) that is mounted on the armament platforms, implies minimum integration costs and shares a large number of common components with the base transponder.

Thomson-CSF claims that the BIFF system has got the widest range and the greatest identification capability in less than a second and at the same time offers a high telemetric accuracy.

Observers point out the fact that, even though the CID workgroup was initiated after hitting one's own forces during the 1990-1991 Persian Gulf air support, the identification systems nowadays do not include air-surface identification. In this situation it is possible for some users of the future identification systems, manufactured according to STANAG, to wish to follow the American concept of using wide band frequency transmitters to conduct fighting.

Conclusions

In conclusion, battlefield identification reduces fratricide and collateral damage, mainly caused by errors in target acquisition, when shots on the enemy hit one's own forces and by identification errors, when allies and neutrals are mistakenly attacked, based on the fact that they are hostiles. In current and future military operations, battlefield identification will be one of the essential factors in gaining information supremacy and implicitly in winning the fight.

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THE IMPORTANCE OF USING TOPFAS APPLICATION PACKAGES IN THE OPERATION PLANNING PROCESS

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Abstract:

Currently, with the development of the new NATO guidelines, the implementation of the new Operations Planning Directive (COPD) has also led to the implementation of integrated software solutions that optimize all processes within the C4ISR system.

This article will highlight the importance of using integrated software solutions that represent a system of analysis, planning and evaluation, implemented through a network platform in which all information created by analysts, planners and evaluators are distributed and are made available to all users, from within the planning process, to be easily transformed into briefings and formatted documents (OPLAN, OPORD, FRAGO, etc.).

TOPFAS is the basic system for supporting the data needed for the process planning, force activation and simulation, improving as much as possible the planning process with graphical tools, i.e. the design of the operation, the phases, the tasks, the geographic instruments (maps multi-layer) for the specification of environmental factors and conditions, comprehensive analysis of the operational environment as well as the forces disposal.

Keywords: TOPFAS; operation planning process; FAS software; formatted documents.

Introduction

The concept of implementing data management solutions in NATO for computer-aided doctrine-based planning began in 1998 as part of SHAPE's¹ scientific program and continued until 2003 when the program passed to the ACT who continued to develop software through NC3A. It, eventually, arrive in the same year after several field tests performed during various exercises (STRONG RESOLVE and ARRCADÉ FUSION) and in real operations (ISAF)².

Currently, with the development of the new NATO Guidelines, the implementation of the new NATO Operations Planning Directive (COPD) that includes relevant aspects of emerging concepts such as Comprehensive Operations Planning and Execution / Theater Capabilities (also known as the Effect-Based Approach – EBAO and Comprehensive

¹ Supreme Headquarters Allied Powers Europe, <https://shape.nato.int>, accessed at February, 2, 2019.

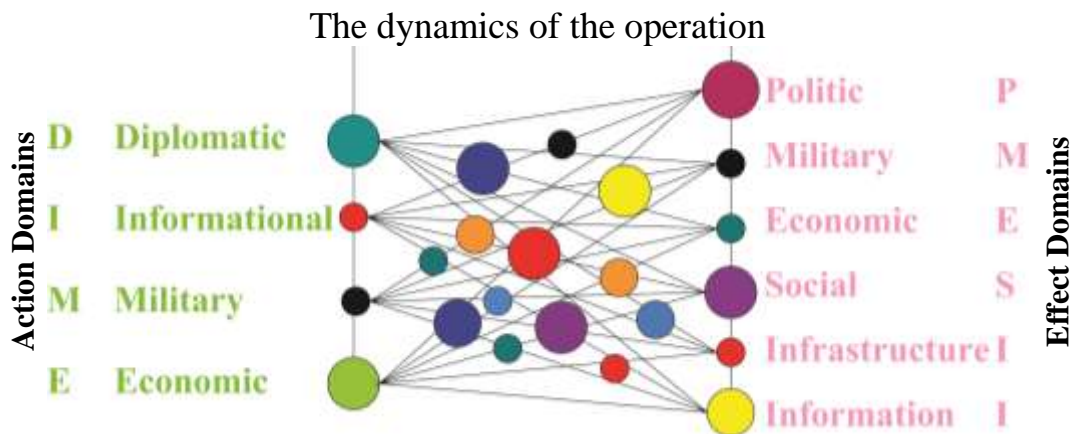
² <https://www.nato.int/nrdc-it/magazine/2009/0914/0914h.pdf>, accessed at February, 2, 2019.

Approach – CA) led to the implementation of integrated software solutions to optimize all processes within C4ISR³.

Modern crises are characterized by complex interdependencies, conflicts occurring as a result of a combination of historical, political, military, social, cultural and economic disagreements. These misunderstandings are usually interdependent and, as a result, require a variety of solutions. At both national and NATO level, six areas are taken into account in the PMESII concept (Figure 1) used in the engagement space⁴.

Through an analysis of goals, strengths and weaknesses and interdependent relationships among the main actors within the six domains, the database of their behavior within the engagement space is made. This database is then used by decision-makers at all levels of management to determine how to influence their behavior so as to ensure the achievement of national or allied strategic goals and the desired end-state, thus achieving the goals of the international community.

The conditions of each of the six areas of the engagement space can be influenced by the application of one or a combination of the four power tools of a state: military, political / diplomatic, economic, civilian.



Opposing forces and their actions are integrated into the operational environment;

In NATO terminology DIME + PMESII = PMCE

Figure 1. Operation Dynamics

A key element in the dynamics of the operation is System of Systems Analysis (SoSA) to identify the operationally relevant elements within the PMESII dimensions as well as the relationship between the elements, both within and between domains. This is sometimes represented by a network of nodes (elements) and links (relationships). Nodes can represent individuals, groups, organizations, forces, goods, installations, or any other element that has been identified and defined as relevant to the operation. SoSA is, of course, a system itself and is being examined using system analysis techniques. Associated with each of the elements (nodes) are sets of attributes (variables) that can take different values. Although some values might normally be expressed in qualitative terms (good-bad, high-low, etc.), they are translated using different mathematical techniques in quantitative terms.⁵

³ Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance, the U.S. term for C4ISTAR.

⁴ Allied Command Operations, Comprehensive Operations Planning Directive - COPD INTERIM V2.0 p.1-8, 04 October 2013.

⁵ Håkon Thuve, NATO C3 Agency, 2006 CCRTS Conference, San Diego, A State State-Space Formulation for Effects Based Operations.

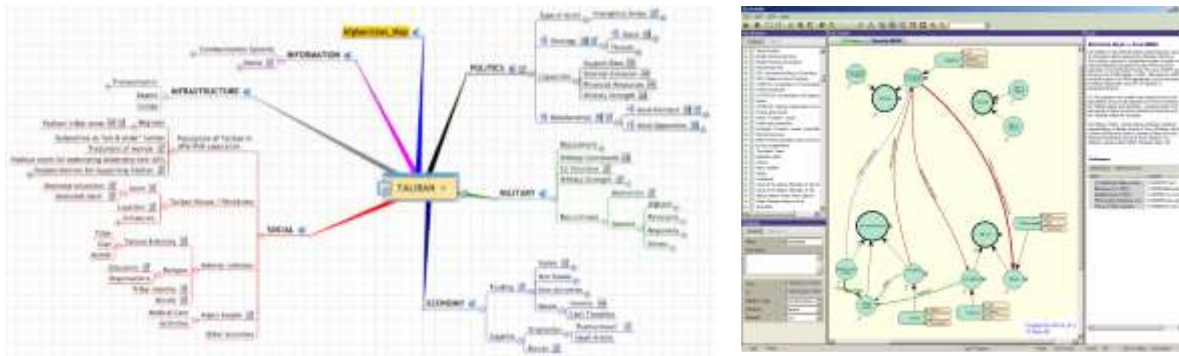


Figure 2. PMESII Analysis model⁶

NATO processes and procedures for a comprehensive approach to operations are well documented in many NATO publications, such as the NATO Crisis Response System Manual (NCRSM), ACO Operations Planning Directive (COPD) and the NATO Knowledge Based Handbook.

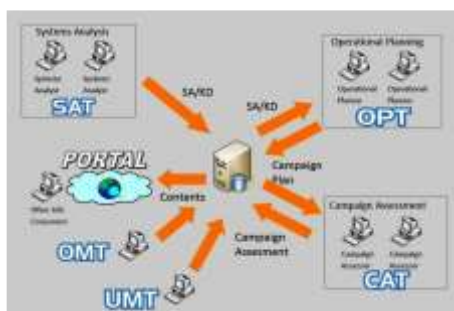
COPD describes the procedures and responsibilities governing the preparation, approval, promulgation, distribution, implementation, review and administration of the Operations Plans.

The Comprehensive Approach to Operations requires a vision and a holistic approach, analyzing both the engagement space as a system of systems and the systems within it. Analysis, operations planning and staff evaluation should therefore develop a common understanding of the situation and systems involved.

As a solution to support the necessary data for the process planning, the activation of forces and their simulation in accordance with the Operations Planning Process, an integrated software tool for all functional services, TOPFAS⁷ (Tools for Operations Planning Functional Area Services). It provides a database and tools for the planning process, operations plans, and the audit process for force generation. TOPFAS improves as much as possible graphical tooling: the design of the operation, planning phases, geographic tools, comprehensive analysis of the operational environment as well as the disposal of the forces.

This analysis system makes available to all users, through the planning and evaluation process, through a network platform in which all the information, all the design elements of the operation, created by analysts, planners and evaluators are distributed in order to be transformed easily in briefings and formatted documents (OPLAN, OPORD, FRAGO, etc.).

TOPFAS's integrated service system consists of a set of applications interconnected to the same databases (Figure 3).



1. SAT- System Analysis Tool
2. OPT- Operations Planning Tool
3. CAT- Campaign Assessment Tool
4. OMT- Order of Battles (ORBAT) Management Tool
5. TWP- TOPFAS Web Portal⁸

Figure 3. Integrated applications in TOPFAS⁹

⁶ http://www.dodccrp.org/events/2006_CCRSTS/html/presentations/007.pdf, accessed at February, 2, 2019.

⁷ Allied Command Operations, Comprehensive Operations Planning Directive – COPD INTERIM V2.0 pp.2-9, 04 October 2013.

⁸ http://www.isglimited.com/yahoo_site_admin/assets/docs/ISG_TOPFAS_Support_Services.21174448.pdf, accessed at February, 2, 2019.

1. The SAT service is designed to support the strategic, operational or tactical planning process in accordance with COPD and the Comprehensive Approach concept (CA). It can describe “engagement space” as a system with graphical representation in the form of systems with influence relations and studied with systems analysis techniques (Figures 1 and 2). This tool makes an initial estimate of the situation and is capable of producing a proper initial understanding of the comprehensive assessment of the operational environment.

2. The OPT Service is intended for the collective use of data required for the planning process at all three levels in accordance with the NATO Operations Planning Directive, tailored to the specific needs of users. At the same time, it allows planners to build the design elements of the operation by applying operational art and turning them into formatted briefings and documents (OPLAN¹⁰, FRAGO¹¹, SOR¹², etc.).

3. The CAT service is designed to develop, plan and evaluate campaigns in support of the planning process. This tool supports end-state analysis by Measures of Effectiveness (MOE) as well as Measures of Performance Indicators (MOP). This allows assessment, planning, collection and reporting of quantified data as well as analysis of accidents and trends.

4. The OMT service is intended to populate the TOPFAS database with the available ORBAT (Order of Battle) forces, which will support the planning process.

5. The TWP service is designed to access the necessary information for the planning process through secure networks using web protocols.

Planning operations within NATO

In the early years of NATO training, planning was focused exclusively on one major concern: the potential need to defend NATO’s territory in Europe. The continuous review of specific plans for this has led to the need to develop explicit versions of NATO's general concepts, a doctrine for the application of operational art and procedures for the elaboration of operations plans. With the end of the Cold War, the emergence of the new security environment and the expansion of NATO’s role to include deploying forces in peacekeeping operations outside NATO territories led to the need to establish a new NATO doctrine and new planning procedures for such operations.

As part of the NATO operations planning, there is a clear division of responsibilities for the initiation, development, approval, execution, revision and cancellation of operational plans. These responsibilities are shared between the North Atlantic Council (NAC), the Military Committee (MC), the SACEUR and the subordinate NATO commanders. The NAC is the highest political authority within the Alliance and as such is responsible for initiating and approving all strategic operational plans developed in response to a current or emerging crisis. The MC is the senior NATO military authority and is accountable to the Council for the overall conduct of the Alliance’s military affairs. This is the primary source of military advice to the Council and the Secretary General (SECGEN)¹³.

NAC decisions lead activities at the strategic level through a series of activities: 1. Initiating a comprehensive Political Military Estimate (PME), which includes the formal analysis of a possible crisis, including the development of a strategic evaluation of the SACEUR (SSA) and Strategic Options response, including the task of developing military response options (MRO); 2. Initiate planning of operations by issuing an NAC Initiation

⁹ <https://www.nato.int/nrdc-it/magazine/2009/0914/0914h.pdf>, accessed at February, 2, 2019.

¹⁰ AAP-15, Operation Plan.

¹¹ AAP-15, Fragmentation Order.

¹² Statement of Requirements is used here as a general term to capture any requirements needed to implement the military strategic concept, including CJSOR, TCSOR, manpower SOR and/or ROERREQ.

¹³ Allied Command Operations, Comprehensive Operations Planning Directive - COPD INTERIM V2.0 p.3-1, 04 October 2013.

Directive (NID); 3. Endorse the Strategic Concept of Operation (CONOPS) and Operation Plans (OPLANs); 4. Initiate force activation through the Force Activation Directive (FAD); 5. Performing an operation by issuing an NAC Execution Directive (NED); 6. Perform periodic mission reviews (PMRs), provide strategic assessments of progress on achievement of strategic objectives; 7. Reviewing the strategic aspects of an ongoing operation under the responsibility of SACEUR, provides strategic assessment and possible military options for adaptation (including state-level objectives and NATO strategic objectives) to strategic and operational conditions; 8. Plan the transition and termination of military operations following normal procedures¹⁴.

Planning operations within NATO can be accomplished in a wide range of conditions, from routine: immediate reaction to an attack on NATO territory. The main categories of planning situations are: 1) Responding to an emerging crisis situation where NATO could usually become involved in a peace support operation in which NATO engages following a UN resolution/mandate and a request intervention; and 2) Prudent military planning for potential future operations that are not linked to any kind of threat or crisis situation but which nevertheless requires early planning to ensure NATO's ability to respond if it should do it or be invited to do so.

Basic planning steps and OPP products are illustrated in Figure 4.

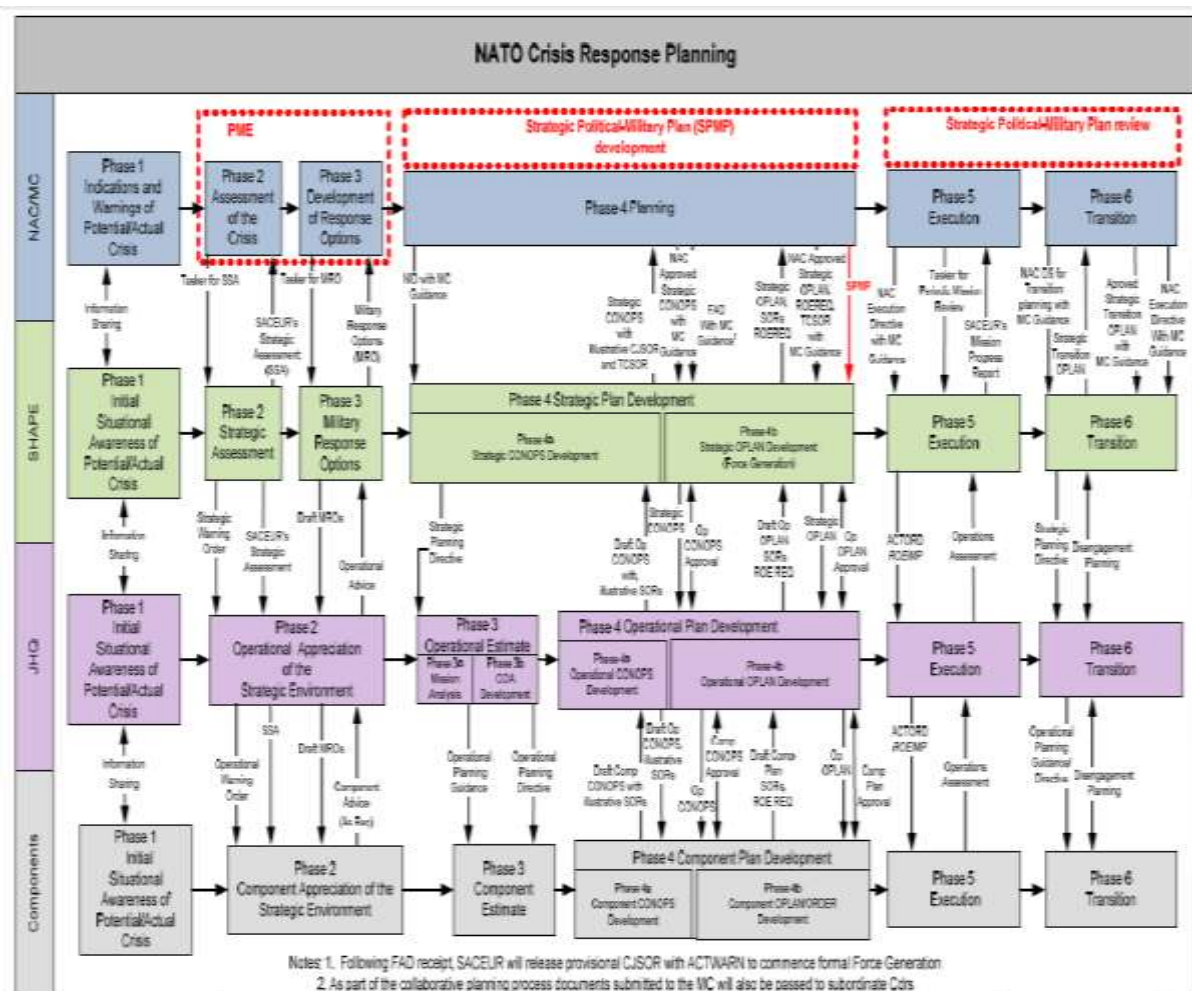


Figure 4. Basic planning phases and OPP products¹⁵

¹⁴ *Ibid*, p. 3-2.

¹⁵ Allied Command Operations, Comprehensive Operations Planning Directive - COPD INTERIM V2.0 p.4-4, 04 October 2013.

Key strategic planning products at the strategic military level are CONOPS and the Statement of Requirements(SOR). SOR is the detailed estimate of the forces and capacities needed to carry out the operation that has to fulfill the tasks specified in the initiating Directive. SOR is expressed in terms of generic units and / or equipment¹⁶.

Once the force generation process begins, interactions between NATO and nations continue throughout this process. At the end of the force generation process, the generic requirements of SORs are replaced by real forces contributions to nations.

The nations contributing forces are ultimately responsible for the movement and transport of the equipment and their support for the operations in the theater. National planning is, of course, subject to close coordination with the competent NATO authorities.

TOPFAS in support of NATO operational planning

The development of software in the area of planning so far has progressed through both laboratory and user reviews. In the first laboratory studies, a number of challenges emerged from the different national planning software environments. Also, the operations planning process itself is very creative and covers, including brainstorming techniques, the application of concepts that are not easily translated into bits and bytes. Other requirements for software functionality are formulated by fast response requirements in a real-life planning situation.

In advance planning, initiating a Contingency Plan (CONPLAN), a Generic Contingency Plan (GCOP), a Graduated Response Plan (GRP) or a Standing Defense Plan (SDP) development is the requirement to use the TOPFAS integrated software solution¹⁷.

Operational Planning is implemented in AJP 5 - Allied Joint Doctrine for Operational-level Planning, which describes the fundamental operations planning aspects at the appropriate level, and provides a general framework of fundamental planning principles, process considerations and steps that are tracked in the planning.

In order to support the planning group and not to invest time and effort in using a dedicated planning tool for each crisis response situation, this integrated, simple and intuitive tool should include support for the preparation of all products in the process planning.

Although support for planning and deployment is accomplished by other special

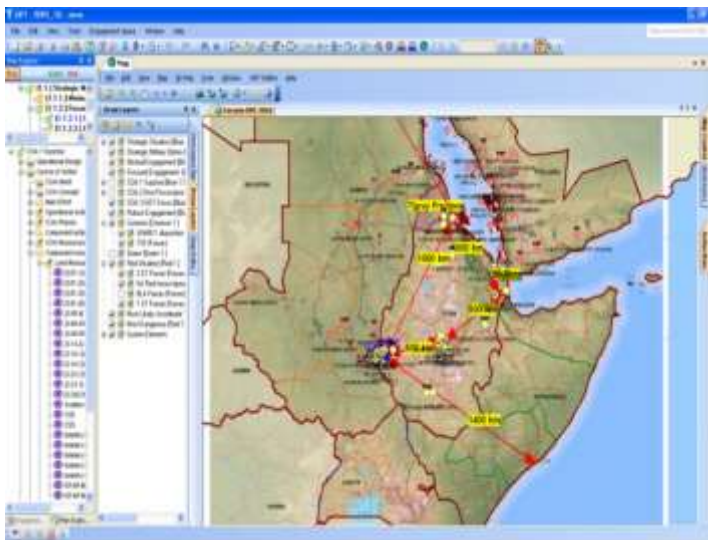


Figure 5. TOPFAS interface

management systems, the scope and purpose of TOPFAS development is to provide software support and a database for all phases and activities of OPP. The TOPFAS functionality for OPP is embodied in integrated software as a Planning Expert (Figure 5) that guides the planner through its process and associated functionality.

Another challenge in designing the system, and in particular in the database, is the OPP, which therefore certifies TOPFAS as a joint planning tool. The way in which entity data is traditionally managed within services

¹⁶ *Ibid*, p. 3-8, Systems Analysis Tool (SAT) provides a mechanism to capture and share information and analysis of the crisis; in Phase 1, consideration should be given to establishing a SAT database to assist collaboration and use of TOPFAS throughout the strategic OPP.

¹⁷ Allied Command Operations, Comprehensive Operations Planning Directive – COPD INTERIM V2.0 p.1-3, 04 October 2013.

is in many ways very different and the challenge of TOPFAS is to combine them into common representation and processing functions.

In addition to the basic functionality associated with planning concepts, products are extended into the network and provide an interface to support collaborative planning and connection with other NATO military systems. TOPFAS's main users are NATO Strategic Headquarters, Regional Headquarters, and other NATO military Headquarters, designated for task planning and operations conduct. It will provide a common database and tools for the NATO OPP as well as a common space for operations plans and the force generation process.

In real-time planning, it directly interfaces with Logistic Management Systems (LOGFAS). The functionality of planning in TOPFAS requires the database to include extensive data on the forces with which nations contribute to the operation. Although initial planning results are expressed in terms of generic requirements and capabilities, it is clear that planning from the beginning must take account of real limitations of capabilities. Once the planning has progressed to the generation and activation of force, the operational data requirements become evident. The necessity and functionality of data management within TOPFAS for national forces make this tool useful beyond the planning requirements of operations.

The software supports the user in the preparation activities of all the planning products described in Figure 4 through the planning phases.

Work from the first phases of the NATO OPP targets the early and rough estimates of forces requirements and, finally, the revised SOR, which is the strategic commander's feedback to policy on the resources that must be made available. For nations, this is the cost of the operation, both in financial terms and in participation.

TOPFAS's support in this regard is to provide an audit process for each version of SOR in the planning process through the design of the operation. The key to this audit process is the tasks the forces have to fulfill in order to carry out the assigned mission.

Each unit, staff and / or equipment will have one or more tasks to perform within the operation, which are interconnected to the database library of all the tasks the forces can execute under NATO command.

A major concern of planners is to create and configure the appropriate forces for the operation in the database. The forces and equipment of TOPFAS are represented on several levels as a hierarchy of command. The forces of all software services are represented in the same structure of the TOPFAS database as real units (named units), exercise units and generic units.

The representation of military equipment in TOPFAS is organized in a hierarchical structure of the six characters, forming the code from the reporting system of the equipment (RIC – reportable Item Codes). All NATO military equipment has an appropriate RIC code that allows the classification of similar equipment according to their functionality and their basic characteristics. Some equipment has Figure of Merit (FoM)¹⁸, which is a measurement system for both the quality and the quantity of equipment owned by the unit. FoM is used to measure combat power through mathematical operations, providing a tool for calculating the force ratio in mission analysis. It also provides a quantitative measure for comparing contributions with the forces of the nations¹⁹.

¹⁸ A numerical unit based on one or more characteristics of a system or equipment that is a measure of efficiency or effectiveness. The figure of merit is determined by the primary characteristic that faces a certain purpose.

¹⁹ Håkon Thuve, NATO C3 Agency, TOPFAS (TOOL FOR OPERATIONAL PLANNING, FORCE ACTIVATION AND SIMULATION), 6th International Command and Control Research and Technology Symposium, 2006, http://www.dodccrp.org/events/6th_ICCRTS/Tracks/T4.htm, accessed at February, 2, 2019.

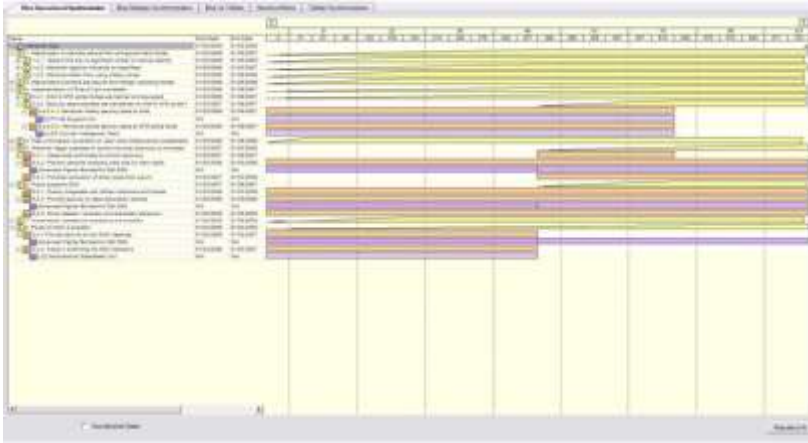


Figure 6. Gantt Time Interface. Sync matrix²⁰

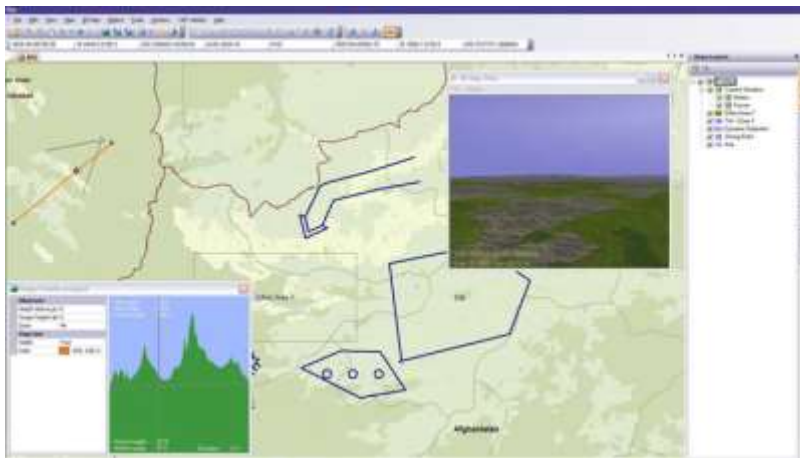


Figure 7. TOPFAS GIS Service (Geographical Information System)²¹

The next step in TOPFAS is to define the time and place where tasks have to be performed. Time is usually set in a time window that may correspond to a phase of the operation or events. Task synchronization may be different than the synchronization of actual calendar data, in the way it is relative to a reference date for the plan, Day M, Day C, Day D, etc.

Time management in TOPFAS is done in a Gantt-type interface (Figure 6)²². The location for the task will usually be in an area within the theater of operations.

The cartographic tool (GIS service) (Figure 7) from TOPFAS provides all the elements to define areas or locations of different types on different layers of map or layers defined by the user. The user-defined area may be a predefined

area (area of defense, maritime control zone, etc.) or any other type of general area defined by a planner's polygon.

Selecting a real unit for inclusion in the SOR is only possible when it is an element pre-assigned to the operation and the agreement of the nation providing the force is enforced.

Once CONOPS and SOR have been approved, the next major phase in planning is the generation of forces. This is the process by which the strategic commander advances the demands of the nations to provide the forces for the operation.

The final result in terms of TOPFAS is the Allied Forces List (AFL), real with the units or contributions of nations. Once the forces involved in the operation are known, the next stage of OPP, the development of the CONOPS into a detailed plan. The TOPFAS key at this stage is the Allied Disposition Force List (ADL) with additional details of force, communication lines, dislocation time.

²⁰ Håkon Thuve, NATO C3 Agency, 2006 CCRTS Conference, San Diego, A State State-Space Formulation for Effects Based Operations.

²¹ *Ibid.*

²² The Gantt interface is a matrix with horizontal lines illustrating the activities in a plan, carried out over time, indicating the start and finish times respectively, and the duration of these activities. The matrices may also include those responsible for the activities.



Figure 8. LOGFAS²³ (ACROSS and ADAMS)

database, targets, weapon characteristics and operational factors, mission assignment methodology for the GSP (General Strike Plan) calculation, and mathematical models for optimal inventory planning. ACROSS includes a fully relational database of information on forces, weapon systems, ammunition, features, operational factors and missions. Technical data are compiled and checked twice a year. Mission data is based on a review of defense requirements, which also form the basis of NATO Force Planning.

- ADAMS (Allied Deployment and Movement System) represent a system for planning and coordinating deployment plans between participating nations and NATO personnel coordinating the movement. ADAMS is an integral part of LOGFAS (Logistics Functional Area Services).

The description of TOPFAS planning functionality in this paper focused on the main planning line for the operation starting from the initiation directive and reaching the final SOR and ADL.

Conclusions

The Knowledge Development Process (KD) is a continuous, adaptable process and is related to the analysis of systems that provide information to planners and evaluators.

The knowledge is accumulated through data and information, using skills acquired through education or experience, which contribute to the theoretical or practical understanding of a subject. Applied iteratively, the KD process converts basic data into usable information, information needed to become aware of and understand a situation. This process contributes to the preparation of the forces for the execution of a mission by ensuring a high level of awareness and understanding of the political and military decision-makers during the political-military / military decision-making process at strategic, operational and tactical levels.

The planning of operations is oriented towards reaching an end - state and achieving strategic objectives – military and non-military, established at the level of the authorities, given the limitations and material constraints imposed by these authorities. Changing the status of the conditions, from unacceptable to acceptable, will require effects to be reached in order to achieve the planned objectives and thus attain the desired end state. This central idea of

ADL is the ultimate result of TOPFAS planning becoming the basis for further logistics, support and transportation planning by the NATO Logistics Management System:

- ACROSS²⁴ (Allied Command Resource Optimization Software System) is a NATO decision support system for resource logistics planning. It uses mathematical programming models to assist the military planner to determine the optimum equipment and ammunition acquisition. The national concepts of operations and acquisition policies are part of the optimization process. The main features of ACROSS are: the force

²³ http://www.isglimited.com/yahoo_site_admin/assets/docs/ISG_LOGFAS_Support_Services.21174635.pdf, accessed at February, 2, 2019.

²⁴ <https://www.nato.int/docu/logi-en/1997/lo-405.htm>, accessed at February, 2, 2019.

planning determines the combination and sequencing of the actions in time and space, effectively using the resources available to create the necessary effects.

Planning operations using integrated software solutions aims at developing coordinated and synchronized actions in the engagement space with the various power tools. This process is done in a collaborative manner at all levels. The assessment of the engagement space involves monitoring and evaluating the outcome of all the actions taken in its entirety and all associated effects.

As a conclusion, the TOPFAS integrated system allows for a dynamic and collaborative analysis of the concept of a comprehensive approach through a flow in which information and relationships between system elements and the influences of their attributes resulted from the analysis of the system created and managed in the SAT are available in OPT, where planners are allowed to develop and synchronize them in the operations plan, quantified, analyzed and interpreted in CAT, and converge through the design of the operation to the desired end state.

In order to achieve interoperability among NATO member nations, it is necessary that all of these software solutions be implemented and used at all levels in the operations planning process.

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THE IMPORTANCE OF WARGAMES IN THE GREAT BATTLES OF MODERN HISTORY

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Abstract:

The ability to understand and adapt to changes in the environment are critical requirements of future planners. Their preparation for this should also include the lessons learned of the history. In the specialized literature, there are many examples of operations in the history of the past 130 years that will show us the importance of wargaming in planning an operation as an instrument of operational art. By studying these examples, we will be able to discover how to maximize the benefits of wargaming and at the same time reduce its disadvantages.

This article will present some of the war games cases in history, illustrating in the same time how the most important lessons on planning an operation have been learned or ignored.

Keywords: *wargame; lessons learned; military education.*

Wargaming and the world wars

In our opinion, more important than the history of wargames is how they changed the course of a war and, implicitly, that of history. In this sense, the next history cases will illustrate how Germany, Britain, Russia, Japan and the United States of America have successfully used wargames to train and educate militaries in the practice of war and, nevertheless, to write the history of our day. This article will highlight, at the same time, how the most important lessons on planning an operation have been learned or ignored.

German wargaming

The German term *kriegsspiel* (translated as a wargame) comprises a multitude of different kinds of actions, which, apart from the main purpose of instructing officers, is a means of testing new methods and seeking appropriate combat principles.¹

For this purpose, the wargame was also used by one of the chiefs of the German Army Staff, General Alfred Graf von Schlieffen. He led the German armed forces between 1892 and 1906, a time when Europe's great powers were carrying out intense war plans. Von Schlieffen used wargame and his techniques along with standard exercises to test different combat plans against France, which would most likely be supported by Britain and Russia.²

¹ Rudolf Hofmann, *War Games*, (Washington D.C.:U.S. Department of the Army, Office of the Chief of Military History, 1952), p. 7.

² Milan Vego, *German War Game*, (Naval War College Review, Vol. 65 [2012], No. 4, Art. 10), <https://digital-commons.usnwc.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1494&context=nwc-review>, p. 7-9. (accessed on February 21, 2019).

In turn, Helmuth Johannes von Moltke, the successor to General von Schlieffen in the German Army Staff, conducted a more objective and comprehensive wargame to test Schlieffen's plan. The wargame highlighted that the two armies on the "great wheel" side will run out of ammunition before the end of the campaign. For this, Moltke organized two logistic battalions for ammunition supply. However, once the war began, the German plan did not work as the Germans had hoped. Why? What brought trouble to the Germans was not what they simulated wrongly, but what they did not simulate: i.e., the diplomatic and political consequences of their actions. The actions and efforts of Belgian civilians to destroy their own communication lines took the Germans by surprise. There were no such "units" among those they used in the wargame. Moreover, they did not simulate the diplomatic consequences of the invasion of Belgium, meaning the engagement of Great Britain and, ultimately, of the United States of America in the war, which led to the defeat of the German army.³

So the Germans correctly took into account most of the details they had planned in the wargames, but failed to decide the decisive consequences of their invasion of Belgium - the political ones. These consequences were also ignored in the wargames before the German Offensive of 1918, which indicated few chances of decisive success, but the Germans still triggered this offensive⁴. In spite of their failure to win at strategic or operational level, new



Fig. 1. The Battle of the Atlantic

German tactics (blitzkrieg) have gained some temporary advantages for the German forces through the implementation of armed combat principles (surprise, economy of force, maneuver)⁵.

It can be argued that the most decisive war games during the Second World War were not carried out by the Germans. As Hitler came to power, he suspended the development of strategic warfare. Thus, we can say that during the war the Germans fought intelligently at the operational level, but they made less inspired decisions at the strategic level.⁶

In 1938, General Beck, as head of the German Army Staff, led a wargame to explore the prospects of a German invasion of Czechoslovakia. Later, he used this result to persuade Hitler that the invasion of Czechoslovakia would have catastrophic results over Germany and the rest of Europe.⁷ Obviously, Hitler did not take this argument into account, considering that the Czechs would not fight and, in addition, ordered the dismissal of General Beck. The Munich agreement saved Germany from finding out how prophetic the wargame was played by General Beck.

With the tightening of the political-military situation after the Munich agreement, Admiral Karl Doenitz, chief of the German submarine forces, has planning how U-boats could operate in a future war against the British. He had recently developed the tactical group concept (which will be known as *wolfpack*) to attack the escorted convoys. As the war was imminent, he tested the tactical problem of this concept using wargaming techniques.⁸

³ Barbara W. Tuchman, *The Guns of August*, (New York: MacMillan Publishing Company, 1962), pp. 90-91.

⁴ Perla Peter, *The Art of Wargaming*, (Annapolis, MD: Naval Institute Press, 1990), p. 51.

⁵ Trevor Dupuy, *A Genius For War*, (McLean, Virginia: The Dupuy Institute, 1984), pp. 170-175.

⁶ *Ibid.* p. 266.

⁷ Hofmann, *War Games*, p. 30.

⁸ Milan Vego, *German War Game*, pp. 16-17..

In the winter of 1938-1939, Admiral Doenitz led a wargame through which he wanted to test aspects of command and organization, the location of enemy convoys and the grouping of U-boats for the ultimate attack. No restrictions were placed on either side, and the officers in charge of the convoy were full of maneuver across the Atlantic Ocean.

The conclusions drawn from this wargame are as follows:

- if the enemy will organize their merchant ships in the escorted convoy, at least 300 operational submarines will be required to successfully lead a war against these convoys;
- the organization of submarines in tactical groups to search for convoys should be directed by the commander of the submarine forces, and the tactical command is should be delegated to a submarine commander at a certain distance from the enemy and as possible on the surface. Also, a certain number of submarines under construction should be provided with efficient means of communication, precisely to perform this role as submarine commander;
- with the number of existing submarines and those that will be built, given the priorities and speed of construction, there will be no problems for a few years in the war against commercial ships.⁹

At the time the war began, too early for Admiral Doenitz, the concept he had experienced during the wargame proved to be effective against the cause of the allies.

The beginning of the Second World War found the Germans running wargames in all situations. Prior to the campaign in France and the Low Countries in 1940 and the invasion of the Soviet Union in 1941, wargames and exercises of all kinds were conducted to prepare officers for imminent operations. As a result of this vast preparation, "the first days of the battle were carried out according to the plan, without the intervention of the higher echelons".¹⁰

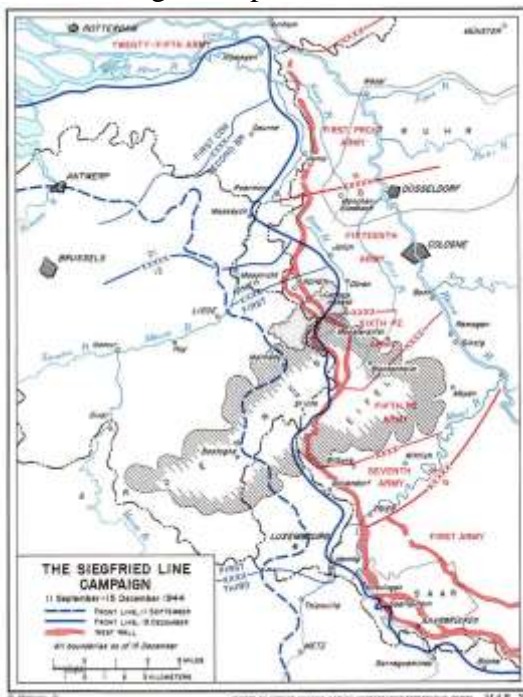


Fig. 2 The Siegfried Line Campaign¹¹
 Division – the 5th Army’s Reserve, was made available to the attacking forces. That’s why

One of the most famous wargames during the Second World War took place on November 2, 1944, during spontaneous attacks by Americans near the German defense line Siegfried (Westwall), attacks which preceded the Battle of Ardennes of mid-December 1944.

The participants in this wargame were even the staff of the 5th Panzer Army and its purpose was to test defensive measures against a possible US attack on the 5th and 7th Armies frontier. Exercise on the map had just begun when a report was received announcing the imminence of an American attack on the Hurtgen-Gemeter area.¹² Field Marshal ordered that, except for the commanders directly affected by this attack, the others would continue the wargame and use the current reports coming from the front as additional information for the course of the game.

Over the next few hours, the situation on the front - and similar to the exercise on the map - had become so critical that the 116th Panzer

⁹ Grand Admiral Karl Doenitz, *Memoirs, Ten Years and Twenty Days*, (Annapolis, MD: Naval Institute Press 1990), pp. 32-33.

¹⁰ Hofmann, *War Games*, p. 16.

¹¹ <https://www.ibiblio.org>, (accessed on February 19, 2019).

¹² Hofmann, *War Games*, p. 20.

General Waldenburg, the commander of Division 116, who was present in the wardroom, received not only a theoretical order, but a real order to alert the structure he commanded. Thus, the alerted division was brought into battle as soon as possible, transforming a simple exercise on the map into a crushing reality.

Japanese wargaming

Japanese officers learned about the principles of wargame, perhaps from the work of the general (with the rank of major at that time) Meckel, who was invited to Japan as a professor at the Army Staff College and Advisor to the Imperial Japanese Army General Staff. Thus, the Japanese War College introduced wargame into its analytical curriculum and it is believed that the success of the Japanese Army in the 1904 Russian-Japanese War was attributed, in part, to "lessons learned" by Japanese officers in wargames.¹³

As the war with the United States was increasingly likely, a series of battle plans were the subject of debate between the Naval Forces Staff, headed by Admiral Osami Nagano and the Combined Fleet, led by Admiral Isoroku Yamamoto. To analyze the effectiveness of a surprise attack on Pearl Harbor and to test how it was carried out, a series of wargames were held at the Naval War College in Tokyo in autumn 1941.¹⁴

In the first wargames, it was predicted that the Japanese forces were detected before they could attend Pearl Harbor, so there were few losses in the US fleet and port infrastructure. The following attacks implied that one-third of the attack planes had been destroyed. Thus, the Japanese continued to revise their plans until they discovered the most favorable approach to reaching the maximum likelihood of surprise. In the last wargame, probably the most successful, the Japanese succeeded in sinking 4 battleships, 3 cruisers and 2 carriers.

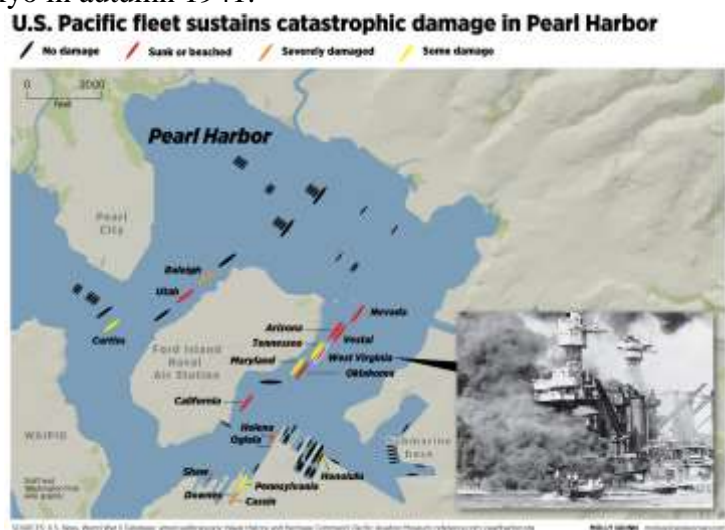


Fig. 3 The Battle of Pearl Harbour¹⁵

This wargame helped Admiral Yamamoto prove that his plan was feasible, but did not take into account a further strike to the development of success. Thus, on December 7, he chose to withdraw his forces after the two waves of attack of the combat planes, thus attracting countless critics of the great historians, who accused him of not launching other attacks to destroy damaged enemy ships, oil tanks and repair bases that have remained intact.

The attack also highlighted another problem: the faulty intelligence planning assumptions. The Japanese assumed that all American carriers would be in Pearl Harbor, and their absence was critical, considering that they would become the basis for US forces' actions in the following naval battles (the Midway Battle).¹⁶

At the end of February 1942, the Japanese Combined Fleet proposed a new plan for an operation in the Indian Ocean. This plan was tested during a wargame on a 4-day Japanese-

¹³ Francis McHugh, *Fundamentals of War Gaming* (Newport, Rhode Island: Naval War College, 1966), pp. 2-18.

¹⁴ Goehring Scott, *Wargaming and Operational Art – How Do We Increase Our Practical Experience Level?*, <https://apps.dtic.mil/dtic/tr/fulltext/u2/a419815.pdf>, (accessed on February 23, 2019).

¹⁵ www.spokesman.com/stories/2016/dec/04/japanese-raid-pearl-harbour/ (accessed on February 25, 2019).

¹⁶ Peter, *The Art of Wargaming*, p. 57.

Yamato flagship, under the leadership of Admiral Ugaki, which would overlook certain rules set by the umpires.

During the wargame, there was a situation where Admiral Nagumo's aircraft were attacked by the US land – based aircraft while his own forces launched an attack on Midway. In accordance with the rules of the game, Lieutenant Commander Okumiya, a senior officer in the fourth division, who served as an umpire, requested interruption of the game to determine the results of the bomb attack.

Following this analysis, he determined that the enemies launched a number of nine attacks, and the Akagi and Kaga ships were sunk. On the other hand, Admiral Ugaki intervened in this analysis by reducing the number of enemy attacks to three, and the result was the sinking of the Kaga and the light damage of the Akagi. Moreover, the Kaga reappeared in the next part of the game, participating in the attacks on New Caledonia and the Fiji Islands. Thus, the lack of objectivity and realism in the pursuit of these wargames led to decision-making in favor of the Japanese, history showing exactly the opposite in the battles unfolded.¹⁷

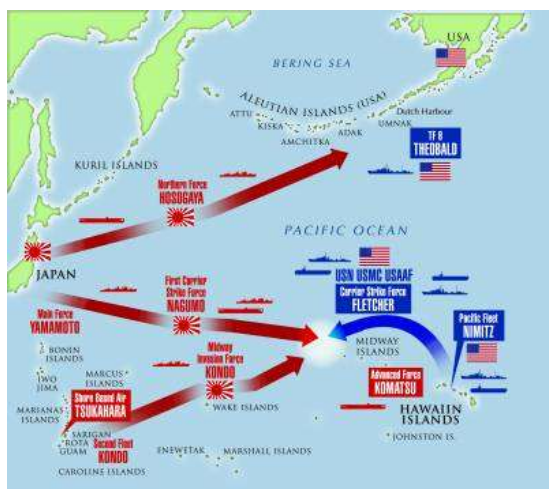


Fig. 4. The Battle of Midway¹⁸

The disaster of the Midway Battle did not prevent the Japanese from engaging in wargames, but it certainly made them more careful in the game arbitration and, last but not least, the choice of participants who play the role of the opponent (the red forces – the US forces respectively). After the assault of Marine Forces at the Guadalcanal in August 1942, the Japanese conducted a series of wargames to explore their possibilities to destroy the United States forces in the southern Pacific Ocean.

Thus, officers from the Japanese Naval Forces Staff, who were familiar with the current situation of the Japanese fleet, were designated to play the role of the Blue Forces (Japanese Forces).

In order to get the best participants for the Red Forces, the General Staff called for the presence of naval intelligence officers employed by Japanese Embassy staff in the United States and requested their repatriation precisely in order to conduct a well-documented and informed wargame on the current conflict situation. This Red Force team will demonstrate during the wargame that Japan's only solution was to conquer certain key objectives and to consolidate them as quickly as possible, because the US great resources and war potential would certainly affect the Japan's war potential to the limit of survival.¹⁹

Russian wargaming

Russian forces have adopted wargame later than other European countries, but after 1870, its techniques will become essential in the training of officers. Creating wargames did not always attract the expected result. In 1903, the Russian War Ministry announced that the main causes of the failure of these wargames were the inability of wargame directors to increase interest in their pursuit, too much adherence to standard models (lack of innovation,

¹⁷ Peter, *The Art of Wargaming*, p. 58.

¹⁸ <http://www.warfaremagazine.co.uk/> (accessed on February 23, 2019)

¹⁹ Alfred Hausrath, *Venture Simulation in War, Business and Politics* (New York: Mc Graw Hill Book Company, 1971), p. 32.

imagination), lack of good directors of the wargames, lack of interest from the commanders, and insufficient familiarization of the participants with the tactics of the three arms.²⁰

In 1914, the General Staff of Russia conducted a wargame to test the mobilization plans against Germany and the initial attack in eastern Prussia.

The Russian plan envisioned an attack by two armies, one operating in the northern part of the Mazurian Lakes (north-east of today's Poland) and one from the south. The wargame was realized to test the course of action of the Russian army, revealing a number of vulnerabilities.

Due to the separation of the two armies, caused by the geographical configuration of the land in that area, the time of advancement was crucial. If one of the armies started the attack too late, the other was exposed to a German concentrated counterattack.

The wargame indicated that in order to avoid a decisive attack, the Russian Second Army would have to start the march three days before the first Army, an action not foreseen in the original plan. This change, so clearly identified during the game, was not taken into account either in the plan or during the battle.²²

The Germans identified the same problem with the attack of the Russian forces during their own wargame, but they took it into account. Thus, the German Eighth Army, under Hindenburg and Ludendorff, destroyed the two Russian armies in the Battle of Tannenberg.



Fig. 5. The Battle of Tannenberg²¹

So every nation has developed its own wargame, but Russia has failed to take into account its results.

British wargaming

One of the most important and influential British personalities of the late nineteenth century, who was interested in highlighting the importance of wargame, was Spenser Wilkinson. In his paper "Essays on the War Game," Wilkinson states that warfare is the most useful form of military study if properly conducted, but may be responsible for defeat if misused. In his view, wargames were mainly useful to improve understanding of the tactical and strategic context by the participants.²³

Initial concerns about a British invasion by the Germans in 1905 prompted the British General Staff to explore this possibility by conducting a wargame.

In 1905, Major General J. M. Grierson led a strategic wargame to simulate the outcome of the war between Germany and France. This wargame was made on a much wider scale than had been conceived and required detailed planning that took place in real time.²⁴

²⁰ Farrand Sayre, *Map Maneuvers and Tactical Rides* (Massachusetts: Springfield Printing and Binding Company, 1912), p. 25.

²¹ www.emersonkent.com/map_archive/battle_of_tannenberg_1914_A.htm, (accessed on February 24, 2019).

²² Hausrath, *Venture Simulation in War, Business and Politics*, p. 23.

²³ Andrew Wilson, *The Bomb and the Computer: Wargaming from Ancient Chinese Mapboard to Atomic Computer* (New York: Delacorte Press, 1969), p. 12.

²⁴ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/641040/doctrine_uk_wargaming_handbook.pdf (accessed on February, 2, 2019).

The purpose of this wargame was initially for instruction, but then became the basis of British military planning for the coming years.²⁵ The scenario implied that the war between France and Germany broke out in January 1905. For two months, the Germans attacked France in the same region it had suffered during the Franco-Prussian war between Sedan and Belfort.

Being blocked in their attack, the Germans decided to send more than 250,000 soldiers to flank French defense by going through Belgium. But Britain, as a guarantor of Belgium's neutrality, will be forced to enter into war.

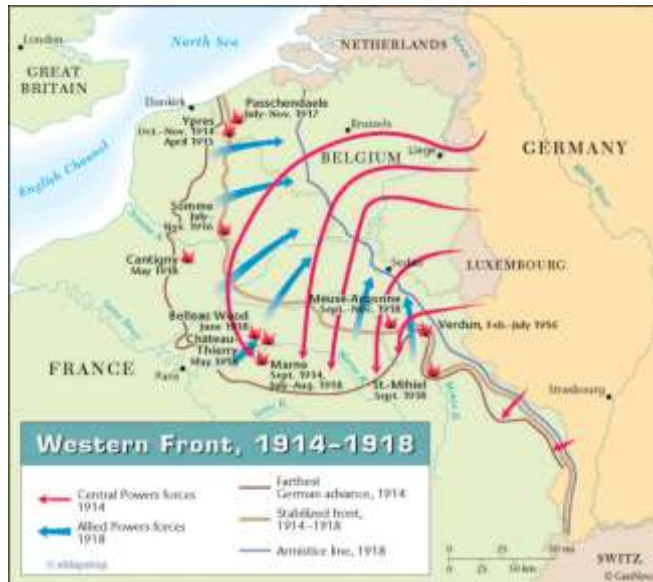


Fig. 6 Western Front²⁶

The wargame was a three – sided one. Colonel C.E. Callwell, who probably had a déjà vu when he became the commander of the 1914 operation, played the role of the British Force Commander. Major General Robertson, head of the foreign intelligence unit of the Military Intelligence Department, played the role of commander of the German forces. The Belgians were represented by Major A Lynden-Bell, a staff officer.²⁷

Several interesting perspectives were highlighted during the war. One of the most dangerous was the time required to transport a substantial number of British forces over the English Channel using existing plans. The wargame showed that the available ships were so limited that

until the tenth day, only 22 ships were operative. Completing the convoy lasted 34 days.

The most important conclusion from this wargame was that an invasion of Belgium by Germany can be expected to be successful and France will not be able to resist the attack without the help of another state. This conclusion led, after 1904, to formal talks with France and the evolution of the Anglo-French Alliance, by virtue of which France mobilized in 1914.²⁸

American wargaming

W.R. Livermore is considered as the one who introduced the wargame in the United States. In 1879, Livermore published two volumes that featured the wargames called *The American Kriegsspiel*. Livermore's wargames were obviously based on the model of the German school, but in the opinion of many American soldiers, they were not suited to the specific conditions of the United States.

For the training of young American officers, in the interwar period, a series of wargames were held at the Naval War College (NWC), which aimed both at learning history and fighting tactics. These wargames were conducted to test war plans against the Red Forces (British Forces) and the Orange Forces (Japanese Forces).²⁹

Thus, during the interwar period, 136 wargames were developed, and only 8 of them were not focused on the Orange War Plan. Like the NWC wargames, the main American naval exercises in the Pacific were to test a certain part of this plan, revealing a number of

²⁵ Wilson, *he Bomb and the Comuter: Wargaming from Ancient Chinese Mapboard to Atomic Computer*, pp. 26-27.

²⁶ <https://www.google.com/amp/s/yournz.org/2017/10/12/the-battle-of-passchendaele/amp/>, (accessed on February 23, 2019).

²⁷ Wilson, *The Bomb and the Comuter: Wargaming from Ancient Chinese Mapboard to Atomic*, p. 26.

²⁸ *Ibid*, p. 32.

²⁹ Peter, *The Art of Wargaming*, pp. 64-68.

21 issues that needed to be solved for this plan to lead to success (the first problem that occurred in 1923 provided for the need to build vessels specialized in the transport of aircraft. The first American aircraft carrier was transformed from a ship carrying coal, but it could only launch a single aircraft - entered active duty in 1924; problem 21 appeared in 1940 and implied lack of training in night-time and low-visibility operations).³⁰

Direct feedback between naval exercises and NWC wargames has made a significant contribution to the accurate and realistic planning of operations in the Pacific Ocean.

The Battle of Savo Island has highlighted some eloquent problems that neither wargames nor naval exercises have either been able to identify or have not taken into account (the technical tactical features of the Japanese torpedoes and the possibility of a time attack nightly).³²

In most of the actions taken by the United States naval forces during the Second World War, the lessons learned during the NWC wargames and those identified during the exercises led to the achievement of the decisive points of the Pacific operations.

Conclusions

From the historical cases presented above, the following conclusions can be drawn:

- Wargames are used to prepare future commanders at all levels of command, in the decision making process and situation assessment;
- The deployment of as many wargames as possible and the thorough study of military history, especially of naval history (applicable in our case, to naval officers), contribute significantly to the development of creative thinking. In this context we can say that wargames are an instrument for the application of operational art;
- The determination of the participants in a wargame must take place, in particular, according to the experience and the way of knowing the situation in their area of interest and not according to the rank they hold;
- It is imperative, during the course of the wargame, to obey the established rules and maintain the objectivity and the real character of the actions, especially in the arbitrary process;
- The problems identified during a wargame must be strictly considered and taken into account in the following phases of the operation planning;
- In the development of a wargame, account must be taken of all military, political, economic, diplomatic aspects relevant to the context in which the operation will take place and the consequences thereof;
- Testing new methods and the fundamentals of a doctrine can be effectively accomplished by using wargames.



Fig. 7 The Naval War College³¹

³⁰ James Miller, *Gaming the Interwar - How Naval War College Wargames Tilted the Playing Field for the U.S. Navy During World War II* Paperback – June 12, 2014 by Naval War College, (accessed at February 2, 2019).

³¹ <https://www.slideshare.net/mobile/roger.smith/a-history-of-serious-games/>, (accessed on February 23, 2019).

³² John Costello, *The Pacific War 1941-1945* (New York: Rawson, Wade, 1981; republished by Harper Perennial, 2009), p. 325.

By analyzing how the great leaders in history have developed their creative thinking and, implicitly, how they applied the operational art, through military education, intense participation in exercises and wargames, we can prepare ourselves for future operations.

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THE INTERESTS OF THE DANUBE IN ROMANIA AND ITS NEIGHBORS; RISKS AND VULNERABILITIES OF THIS AREA

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Abstract:

This article analyzes the Danube interest of Romania and its neighbors, the risks and vulnerabilities of this area from the perspective of belonging to the European Union and the North Atlantic Treaty, as well as its geographical position at the edge of all empires, the alliances Romania has made and is a part of. We have analyzed this operational environment from a political, militar, economic, social and infrastructure point of view using the comparative method and the historical research method. The result of this analysis highlights the fact that the spaces of influence collide first at the periphery, the fact that regardless of the subsystem they were included in the Romanian territories formed part of the underdeveloped periphery of the empire or alliance, the fact that are worrying developments at European or global level with direct influence such as the annexation of the Crimea, Europe's two speed scenario, the resurrection of political and economic protectionism, increasing tensions between Russian and the Western powers, the immigration crisis in Europe just to mention few.

The implication of this study can lead to resizing the area of responsibility of River Flotilla, a more determined approach to the European Union Strategy for the Danube Region, the Presidency of which Romania holds for 1 year from 1st of November 2018, and also to solve some problems of the Lower Danube especially since Romania holds the Presidency of the European Union for 6 months starting January 1st 2019.

Keywords: interests; risks; vulnerabilities; strategy.

Introduction

Water courses are for any nation an element of progress and civilization. Transferred to the Danube, this is true in the work of the great geographers Simion Mehedinti and George Vâlsan, whose view is that the Danube is the "king of the rivers of Europe", being the watercourse that crosses the old continent from sunset to the east, a natural way of uniting the industrialized countries with rich raw materials in the north and south-east of the continent.

The Danube has shown geopolitical and geostrategic interest from antiquity to the present day. Throughout this period, the course of the Danube represented: the border between empires and states, communication channel, used for commercial and military purposes, settlement area of human communities with rich natural resources, and a zone with direct or indirect hydropower potential (28.86% of Romania's electricity production in 2016)¹.

¹ Report of the National Regulatory Agency for Electricity on the results of the monitoring of the electricity market.

The Danube is the largest river in Central and Southeast Europe and the second in Europe, an important link on the continent, being located in the strategic interest area of the North Atlantic Treaty Organization (NATO), the European Union, Russia and other states in the former Soviet space. The strategic importance of the Danube is given today, first of all, by its economic value.

Today, when the Danube can reach the North Sea ports, the geostrategic importance of Romania and the Danube is increasing in the context of European and world water exchanges. The old and new states that appear on the Central Europe map are dependent on the Romanian approach, the way this water transport facilitates, through the possession of the mouths of the Danube and the Danube-Black Sea canal.

Increasing NATO's interest in this area and the opening offered by Romania could be reasons for trying, by any means, to make our country unable to capitalize on its main geopolitical and geostrategic advantages, such as the mouths of the Danube and the waterways accessing the Planetary Ocean.

As a result of Romania's accession to the European Union, part of the union's boundary and, implicitly, its protection lies with our country. The responsibility for securing the border is even greater as Romania is about to enter the Schengen area, and as a result, our country must also meet the conditions imposed on any member of the Schengen area. Border control is in the interest of not only the Member States whose external borders are being carried out, but also the interest of all the Member States that have removed control at internal borders.

The military balance in the Danube area has undergone important changes in recent years. The accession of NATO to the Central and South-Eastern European countries (except Serbia) has led to an increase in the confidence of the states in the area and the transposition of risk and threat factors to the Danube spill area in the border area adjacent to the former Soviet space.

All Danubian states are interested in creating a climate of security and stability in which cooperation and development projects are being carried out in all areas. However, we can observe that there is uneven development among the Danubian states, and that competing interests are constantly manifested in this space, regardless of the membership of the states in a specific organization.

However, this Lower Danube region is a region of geopolitical and cultural cleavage between the Western European civilization peninsula and Eurasia, which Russia has long been trying to keep under its influence. Another disputed theme is the one about the countless ways in which the fate of this area has been disturbed by the ambitions of one or other of the Great Powers.²

There is a geopolitical theory by Halford J. Mackinder, the founder of modern geopolitics and the first director of the famous London School of Economics, which describes the European periphery as two sections of countries – from the Baltic States to Ukraine and Poland to Bulgaria – which make up the region border between the European peninsula and unified Russia.³

There would therefore be an integrated section in the Western structures, ie the current NATO Eastern Flank, and a "buffer zone", part of the former Soviet space that starts from the north (Belarus) and descends south through Ukraine to the Black Sea, with a low chance of joining the European and Euro-Atlantic structures.

One of the vectors of this area, alongside the Black Sea and the Carpathian Mountains, a source of well-being, but also a potential target for countries with policies and approaches contrary to Romania, is the Danube. The main resources of the Danube are: hydropower

² Valentin Naumescu (coordonator), *România, Marile Puteri și Ordinea Europeană*, Polirom, 2018, p. 18.

³ George Friedman, *Pressure Points, About the Future Crisis in Europe*, Letter, Bucharest, 2016, p. 214.

potential, the possibilities of navigation and transport, industrial water, water for irrigation, fish fauna, tourist potential, the land resources along the Danube and the Danube Delta, some secondary resources (reed, sand, gravel, softwood).

To describe the area under consideration – the so-called operational environment – we will analyze in turn the involved states and their interests related to the Danube River.

Changes in the security environment after Romania's integration into NATO and the EU, geopolitical and geostrategic developments from the beginning of the millennium, as well as the identification of asymmetric risks in the riverine area of interest, led to the redefinition of our country's interests on the Danube River as an entry gate of the Caspian and Middle East routes to central and western Europe.

In the 2006 National Security Strategy of Romania, we find a "tactical level" definition that "national interests reflect the dominant, relatively constant and institutionalized perception of national values. They aim at promoting, protecting and defending – through legitimate means – the values by which the Romanian nation guarantees its existence and identity, on the basis of which it builds its future and on which it integrates into the European and Euro-Atlantic community and participates in the process of globalization."⁴

Depending on their importance, the Danube interests of Romania are classified into: fundamental interests, main interests and secondary interests.

Romania's fundamental interests on the river are as follows: preserving and promoting the nation-wide spirit of the sea and the Danube, the unrestricted access to the river and the sea, the Danube exit to the Black Sea through the Sulina branch, mainly, but also through Chilia and Sfântu Gheorghe river arms, preserving the correct size of the national water area and defending economic interests in the river area, ensuring stability in the area of river interest, ensuring freedom of navigation on riverways, defending infrastructure in the river, rejecting aggression from the river, environmental protection on the Danube River and Danube Delta as well as maintaining the ecological balance of the delta and river ecosystems, participation in military actions of allies and partners⁵.

In the view of authors and decision-makers, a vision reflected in the specialized writings but also in the 4 pillars of the European Union Strategy for the Danube region the main interests of Romania on the river are: promoting the upgrading and updating of the Danube international regime, in order to discourage the tendencies for over-state decisions to be taken by the Danube Commission, the modernization and development of the goods and passenger fleet that corresponds to and responds to the needs of the national economy, ensuring the conditions of continuous navigation on the Danube at a draft of at least 2.5 meters by performing the hydro-technical works for the improvement of the difficult sectors on the Danube, taking into account the perspective of the increase of transit traffic in the European corridor VII⁶, development of the operation and storage capacities in the Danube ports for taking over the goods traffic with products representing an export market of Romania (cereals, fertilizers, finished products), these goods being taken from the southern parts of the country and transported with river ships to both Central and Constanta ports, the development of Danube ports as intermodal logistic centers to improve the interfaces between inland navigation with rail transport and road infrastructure, ensure the application and enforcement of legislation on river traffic, customs traffic, fisheries and environmental protection in the river and Danube Delta, discouraging acts of obstruction of navigation, forming and maintaining the image and the sense of safety of the transport route on the Romanian sector, the existence of naval forces whose level of training and endowment ensure

⁴ *National Security Strategy of Romania*, 2006, p. 6.

⁵ Cornel Marinescu, *Apărarea intereselor României la Dunăre*, București, Editura U.N.Ap, 2007, p. 32.

⁶ *European Union Strategy for the Danube Region 2014-2020*, p. 8.

the optimal protection of river interests, while participating in external missions, derived from membership to NATO and the EU.

The secondary interests of the river are: the modernization of river ports and the construction or construction of new waterways, more active promotion of the localities with tourist and industrial potential located in the immediate vicinity of the Danube, exploitation of Danube and Danube Delta resources, generalization of the use of modern communication and computerization technologies in river navigation on the Danube using the RIS – River Information System, development of scientific research in the fields related to the fluvial environment, creating and ensuring the functioning of the navigation control structures, development of pilotage activity on the river and on the Danube - Black Sea Canal for the safety and security of river navigation, improvement of the river transport procedures⁷.

As a full member of the European Union, Romania's current and more important Romanian river interests in the near future are complementary to European interests, among which we have identified the following: capitalizing on the opportunities offered by river communications linking the Black Sea to the Danube European states and the states situated to the west to the North Sea via the Rhine – Main Channel (the volume of freight transported on the Danube represents 10% to 20% of that transported to the Rhine)⁸, reducing the technological gap between the lower Danube service system and the Rin - Main logistics complex, discouraging acts of obstruction of navigation, forming and preserving of the image and sense of safety of the river transport, increasing the transport and operating capacities by setting up the Danube River, deterring and dismantling the organized smuggling mechanism, creating a framework for the development of inland waterway transport by modernizing the organizational structure and unifying the navigation rules, strengthening river security through the development of military cooperation and proactive participation in regional initiatives.

To fully describe this operational environment, the Lower Danube, we should also analyze the other actors, Romania's neighbors, from a political, military, economic, social and infrastructure point of view, as well as the interests of these states on the Danube.

Hungary, a parliamentary republic, according to the 1972 Constitution, modified in 1989, a member of the North Atlantic Alliance and the EU, benefits from a developed, modern and efficient infrastructure in the field of foreign policy, the Hungarian government focusing on a balance between three priorities: the policy towards Europe, the sub-regional policy, the neighbors and the policy towards the Hungarian minority in the neighboring states.

It can be appreciated that these goals are to convince NATO partners that Hungary is a center of stability in Central and Eastern Europe, being able to monitor stability in the region.

In the relationship with Romania, government policy aims to support the interests of the Hungarian minority in Transylvania, acting for the raising of its economic level by directing foreign investments and direct support. The foundations and non-governmental organizations that financially support the Hungarian community are coordinated by the commissions of the "Office for the Hungarians Abroad", specialized in areas and subsidized from the budget.

At European level, Hungary persuaded the West that its policy towards minorities is not aimed at creating a situation similar to that in Bosnia or Kosovo. Hungary does not conceive a new conflict in the neighboring countries, but it is possible to engage in conflicts in the Balkan region.

But at the same time, in Hungarian politics, we find the behavior of the island, a behavior derived from its ethno-cultural features, a country surrounded by unrelated peoples

⁷ Marinescu Cornel, *Interesele României la Dunăre. Prevenirea și gestionarea situațiilor de criză și război în zona fluvială*, Editura UNAp, București, 2007.

⁸ *European Union Strategy for the Danube Region 2014-2020*, p. 4.

and with which it was often hostile. Their language belongs to an Asian linguistic group, different from that of neighbors, Germanic, Slavic and Romanic. The Trianon moment has further accentuated the feeling of insularity. Closer to us, the differences of development, at least in relation to Slovak, Serbian, Ukrainian and Romanian neighbors, have also contributed to the strengthening of the sense of insularity. Strangely, however, as much as a border country and an island, it claims to be a bridge between East and West, a bridgehead to the countries of Western Europe, a crossroads of Danubian Europe.

On the Danube, Hungary's vital national economic and political interests seek to be the manager of one end of the Danube European logistics corridor, which would serve only the western half of Europe and would require the international effort to open up financing for the construction of the link to the Adriatic Sea.

Bulgaria is presenting itself today as a country with internal stability. The acceptance of economic control by the IMF and the financing of the Monetary Council, which reported the leva to the German mark, produced interest rate hikes, inflation control and the pace of privatization of the economy, while strengthening democratic institutions.

The efforts of Bulgaria's diplomacy as Bulgaria to be treated separately from Romania in the process of integration into the Schengen area seem to be welcomed by the members of this community.

Regarding the Danube and the maritime space, the vital national interests of Bulgaria are aimed at maintaining the current river and maritime boundaries with Romania, rejecting any discussion that concerns the issue of the redraw of the border on the Danube and the issue of the territorial boundary orientation along the coastline.

From an economic point of view, Bulgaria's interests concern the operational maintenance of the Kozloduy nuclear power plant, these interests being in contradiction with Romanian interests and national regional interests regarding the protection against a nuclear accident, possibly in practice, at this constructive type of power plant .

The Republic of Moldova presents itself as a misty state of political dissensions with an anemic and inefficient economy, dependent on Russia's energy resources. The ultimate objective of the current foreign policy of the Republic of Moldova is to defend the interests of the state and its citizens, or, in other terms, to ensure at the external level all the necessary conditions for the good development of the internal policy.

The Republic of Moldova has reached an important stage of its development which imperatively suggests defining a particular strategy. A period that is considered sufficient for recognition, affirmation as a state and its integration into the international circuit as a full member is completed. It has been recognized by the states of the world, is a member of the UN and its specialized agencies, the Council of Europe, the OSCE, the North Atlantic Cooperation Council, is actively participating in the regional and sub-regional cooperation process within the South East Europe Cooperation Initiative (SECI) within the Commonwealth of Independent States (CIS), the Danube Commission, the Black Sea Cooperation Organization (BSEC). Access to the Danube will favor the development of the Republic of Moldova's river and maritime transport and will ensure communication with both the Central European countries, the Black Sea Basin and the Middle East.

The situation in Serbia, considered as one of the instability factors in the Balkan region, is now marked by positive political changes that aim at removing the country from international isolation and resolving the economic crisis. However, the issue remains uncertain and unpredictable, because the social and political reality of Kosovo province is far from reflecting a climate of peace, security, democracy and pluralism. Tensions and incidents persist because it was not possible to reach a political solution agreed by all parties involved, and none of the communities is willing to accept and respect the principles of interethnic tolerance.

Concerning the Danube area, the political interests of Serbia are aimed at maintaining the current river borders with Romania, rejecting any discussion that touches the issue of redrawing the border on the Danube. The river is a great opportunity for Europe, and an even

greater opportunity for Serbia, officials from this country say. The current problems concerning the Danube River mainly concern pollution and waste water, which affects almost every economic sphere - shipbuilding, tourism, agriculture.

From geopolitical and geostrategic point of view, Ukraine is the most important area between Europe and Asia. None of them can feel safe without Ukraine, which, although economically dependent on Russia, has considerable economic and military resources, which determines a particular feature of its international relations. It benefits from a special form of cooperation with NATO, which gives it a privileged position in the new security structure that appears at the regional level.

At present, Ukraine is interested in participating in the materialization of new oil transport projects linking the Black Sea to the Baltic Sea, which would reduce the energy dependence on the Russian Federation.

From the recent history of the Romanian-Ukrainian relations, one quite agitated, recall the statement of the ambassador of Ukraine to Bucharest Aleksandr Cealii, made during the seminar "Danube and European security", held in Tulcea between 6-8 June 1998: "... /open the Rhine for us or we close the Danube for you / "

Ukraine seeks to open economic, transit and operating interest for the Chilia Canal through the entrance of Oceaikov in the Black Sea and the Bistroe Canal. These interests are in contradiction with the Romanian interests of the Europeanization of the Sulina channel as a secondary branch and of the Danube-Black Sea channel as the main branch of the pan-European transport corridor VII.

However, in the last period there has been a warming of relations, in this sense being welcomed the organization in 2018 of a joint exercise on the river by Romanian and Ukrainian military ships.

To detail the international and regional political situation I will present some events that are in progress and which have a direct influence on the analyzed area.

The most alarming involutions on a European and global scale are the rise of nationalism and ultra-right xenophobic currents directed against the post-war European project, terrorism, both through the direct effect and the stimulation of the populist and anti-global populist platforms, the crisis of migration in Europe, the cooling of the relationship transatlantic policy between the Franco-German core and the United States, both before and, most importantly, after the election of Donald Trump, Brexit, the division of Western Europe (Germany, France, the Netherlands) and the Visegrad group (Poland and Hungary) the deterioration of the security climate in the two eastern and southern neighborhoods of the Union, the annexation of Crimea, the war in Ukraine, and the growing tension between Russia and the Western powers, the recoil of pro-Western approaches and the rule of law in Turkey, an important NATO member, combined with the gradual political Islamization of the Turkish state, the revisionist rhetoric of some political leaders in Central Europe, the two-speed Europe scenario or the concentric Europe that would formalize the center and periphery within the European Union, the revival of the temptation of authoritarianism in countries of the Euro-Atlantic area, the resurrection of political and economic protectionism, the general decline of liberal values and principles in the face of the new attraction for leaders and illiberal discourses.

After describing the "operational environment" and introducing the "actors" and detailing the international and regional political situation, we should analyze whether there are risks and vulnerabilities for this area. So, are there or what are the risks that affect Romania's interests on the Danube? Are there or what are the vulnerabilities of this area? In order to answer this question, we need to clarify what the risks and vulnerabilities are and what is the causal relationship between them.

According to the National Defense Strategy for the country for 2015-2019, "risks are the probability of manifesting an uncertain event with a direct or indirect impact on national security".⁹

⁹ National Defense Strategy for the country for 2015-2019, chap. III, Threats, risks and vulnerabilities.

According to the same Strategy, "vulnerabilities are the consequences of systemic malfunctions or deficiencies that can be exploited or can contribute to materializing a threat or risk"¹⁰. So the causal relationship seems to be: dysfunction, deficiency, problem → vulnerability → risk.

To begin with, we will present some of the problems, the most acute deficiencies of this area, problems that determine the most important vulnerabilities.

One of the problems facing the Danube is to maintain the stipulations of the international treaties on freedom of navigation and trade on the river. It can be appreciated that European agreements¹¹ on waterways and ports of international importance will have the same impact on the development of these routes, implicitly on national economies and riparian areas, as well as the Convention on the Construction of Great Roads for International Movements adopted at Geneva on 16 September 1956.

The post-war period of international cooperation throughout the Danube began in August 1948, when the Russian project became the "Convention on the Danube Navigation Regime" (signatory USSR, Ukraine, Bulgaria, Romania, Yugoslavia, Hungary and Czechoslovakia) having as executive body the Danube Commission based in Galați (since 1954 in Budapest). The period is marked by impressive technical achievements and attempts by the former USSR to transform the Danube Commission from a technical body into a supra-state one by means of the votes of the former communist block. After the major changes on Europe's political map since 1989, but especially after the connection of Danube-Main and the Rhine in 1992, the regulations of the Danube Convention, and especially the signatories, no longer correspond to the realities of the time.

The Lower Danube course (as its whole course) consists and contains, on the common side between two riparian states, the state border governed by bilateral agreements.

The border between Romania and Serbia (between Baziaș / km 1075 and the mouth of Timoc / km 845.5) is established by five agreements, protocols and treaties¹² promulgated between 1922 and 1977 between Romania and the former Yugoslavia. In these bilateral documents the talveg¹³ and the middle of the navigable channel are used as origin for the border crossing, the Romanian national territory is compensated by water in the Iron Gates II area for disfavouring in the Iron Gates I area, the islands are nominally identified according to the border but it does not specify the review of periodic agreements or agreements.

The border between Romania and Bulgaria¹⁴ (between the mouth of Timoc / km 845.5 and the mouth of Borcei/km 375) is established by the bilateral convention signed in Sofia in 1908, using the talveg (in the case of several river arms) and the middle of the river (single river arm) as origin for the border route. The Convention lists non-naturally the affiliation of islands naturally associated with the geographical changes of origin and recognizes their

¹⁰ *Idem*.

¹¹ The European Agreement on Major International Importance, adopted in Geneva on 19 January 1996, the Protocol to the 1991 European Agreement on Long Combined International Road Transport and Related Equipment, on Combined Inland Waterway Transport, adopted in Geneva at January 17, 1997, in the Official Gazette no. 314 and 318 of 27 and 28 August 1998, Part I.

¹² Treaties between the main allied and associated powers and Poland, the Serb-Croat-Slovenian State and the Czech-Slovak State regarding certain fronts of these states, Sevres, August 10, 1920. Protocol on the delimitation of the border between Romania and Yugoslavia, Belgrade, 24 November 1922, Borderline description on the Danube between Romania and Yugoslavia, Belgrade, March 18-19, 1933 Protocol between the Government of RSR and the Government of RSFI on the rectification of the Romanian-Yugoslav state border in the area of the main hydropower and navigation system Iron Gates on the River The Danube, Belgrade, February 8, 1975, Agreement between the Government of RSR and the Government of the RSFI on the conditions for the extension of the collaboration for the use of the hydropower potential of the Danube, Bucharest, 19 February 1977.

¹³ Talveg (Romanian word) is the imaginary line connecting the deepest points of the river.

¹⁴ Ionescu, Ion, *Difficulties in drawing the Danube border between Romania and Bulgaria*, in *Our Sea* magazine, no. 28/1998, p. 20.

passage from one state to another on the condition of topographical recognition (at 10 years) and de facto the new route of the talweg and the completion of the formalities, as well as its review at 30 years.

The border between Romania and Ukraine (between the mouth of Prut/Nm 72.5 and the estuary of the Chilia branch through the southern mouth of Musura) is established by a treaty signed in Bucharest in 1961 and a protocol signed in Moscow in 1948.

These provide for the use of the means of the main navigable channel as origin for the border route, by nominally designating the islands that do not have a geographical name (and are indicated by Arabic numerals) naturally transferred from one state to another through the geographical changes of origin and their passage is recognized from one state to another provided *de facto* and *de jure* recognition by both parties and the completion of formalities based on joint border check (at 10 years) and revision of the treaty by replacing border demarcation documents.

The current features of border issues are:

- although two of the former signatories of the joint border recognition documents with Romania no longer exist (RSF Yugoslavia and the USSR), in accordance with generally recognized international law (which determines the rules of succession, as confirmed by Article 11 of the Vienna Convention since 1978), the current Serbia and Ukraine inherit the frontiers of the state border with Romania;

- throughout the Danube, major geographical changes have occurred which have not been recognized on the ground and officially and have not been notified by both parties on a regular basis or at the prescribed deadlines;

- through bilateral agreement between Moldova and Ukraine¹⁵, Moldova received 800 meters of the Ukrainian territory from the intersection of the left bank of the Prut River with the Danube to the east (downstream) in order to have access to river facilities (Moldova being present in the list of ports of inland navigation of international importance, Annex II of the Geneva Agreement of 1996, with a terminal at Giurgiulesti under code P 80-63).

At present, there is no river border agreement between Moldova and Romania, nor have the border stipulations (inherited by Ukraine) between Romania and Ukraine changed, all being summed up as technical activities between border empowers for measurement determination, starting with in 1998, of the common confluence point on the Danube ("triplex confinium") of the future frontiers between Romania, Moldova and Ukraine.

In conclusion, although there are no frictions that could damage the national interests or the international regime of the Danube, the revision of the bilateral treaties on the Lower Danube border to respond to the current geographic and political-administrative changes is another problem of the Danube.

Modernization of riparian fleet and river ports and provision of permanent navigation conditions on the Danube to a draft of at least 2.5 meters through the execution of hydro-technical works for the planning of difficult sectors on the Danube taking into account the prospect of increased transit traffic in Pan-European Corridor VII according to the minimum operational and technical requirements set out in Annex III of the Protocol to the 1996 European Agreement, is the third major problem of the Danube, a technical and economic issue.

The technical discrepancies are related to capacity differences, the fragmentation of navigation on the Main and the Main-Danube channel due to the frequent locks, the type of transport, the type of ships used and the ability to service the ports / terminals and the transport route.

Economic discrepancies are related to traffic distribution, cost price and geographic position, value per freight unit.

¹⁵ *Additional Protocol to the Moldo-Ukrainian bilateral treaty of 23 October 1992*, signed in 1999.

It may be considered that, although important, this logistics corridor can be fragmented if there is not a complete service of the economic requirements, and these breaches can make the carriers choose the road and rail systems. And as the strong rail and road servicing systems are in the Austrian, German, Slovak, Danubian coastal areas and in the adjacent areas of Main and Rhine, it is presumed that the rupture will occur to the rivers on the middle course, and especially inferior course of the Danube.

Navigation and environmental events are by significance and effects the fourth problem of the Danube which can be characterized by: pressures and actions to relocate the economic interest in an area, and disfavoring another area (attempts to transfer economic interest from Sulina to Chilia with the times of "Serpent Island" in 1948, "Rostok" in 1991 and "Bistroe channel"), the attempt to transfer the economic interest from the Lower Danube to the Middle Danube by drawing attention to a Hungarian project linking the Danube to the Adriatic, diversion of public opinion from major issues such as the insecurity of the Kozloduy Nuclear Power Plant to media interests (the Bulgarian "alarms" on pollution by Romanian industrial platforms and on "oil spills" on the river, unconfirmed environmental pollution), imposing the participation of riparian countries in international punitive actions and blocking the Danube without notification to the Danube Commission (embargo on Yugoslavia with significant economic losses to Romania, losses not compensated by the international community).

On the basis of economic, political and even territorial interests, the Danube's fifth problem could be the emergence of a diplomatic offensive from some states seeking to expand its spheres of influence and the Danube riverbanks. Southeastern Europe is displaying various and persistent vulnerabilities – the Balkans have long been considered Europe's "gunpowder barrel" for decades, the events after 1990 confirming the expressive characterization launched at the turn of the 19th-20th centuries.

"One of the persistent wars in the last two centuries has been the selfish control of the waterways of Europe, I mean the Danube, the Black Sea Straits, the Rhine, the Kiel Canal, and all the inland waterways of Europe which border on two or more states," said Harry Truman on August 9, 1945 after Postdam conference.¹⁶

From an economic and social point of view, the security space highlights a series of structural weaknesses resulting from: relative poverty of soil and subsoil, the organization of production, distribution and exchange according to the model of the "chimney" era (heavy industry outdated today), poorly developed infrastructure, lack of capital needed for investment in industrial upgrading and service promotion, relatively poor market, less attractive for major Western investors, persistence of "neo-communist" mentalities in many areas, the important place of the underground economy in the economic dynamics of the region¹⁷.

These "organic weaknesses" are added to: the negative impact of wars and local armed conflicts on national economies and regional economic circuits, some unfavorable results obtained in implementing modernization reforms in the former socialist states, the consequences of the processes of regionalization and economic globalization.

Economic vulnerabilities were a serious handicap in the East European competition for NATO and EU membership. At the same time, this economic handicap increases the dependence of the states analyzed by the big foreign investors and prevents the establishment of sound economic bases, absolutely necessary for the achievement of the regional economic and political cooperation.

From a political point of view, the main weakness of the security system lies in the inability of its components to prevent and manage local crises. Very worrying is the fact that the process triggered in the 1989-1990 political and territorial remodeling of the region has not yet

¹⁶ Stephen Gorove, *Law and politics of the Danube*, An interdisciplinary Study, p. 79.

¹⁷ Constantin Hlihor, *Istorie și geopolitică în Europa secolului XX*, Editura RAO, București, 2001.

been completed. Equally, the backsliding in the assimilation of modern democratic systems of democratic values, the confusing and anemic development of democratic regions, the authoritarian reflections of leaders and society, the signals of political intolerance, all denote the fragile organizational and social basis of democracy. In both the political and economic spheres, there are real obstacles to the process of European and Euro-Atlantic integration.

From a military point of view, the Balkan states lack the resources and mechanisms needed to manage and resolve the large-scale crises, nor can they constrain external aggressions by their own forces.

From an ethno-cultural point of view, the area is an authentic mosaic of peoples, cultures and religions. Although the ratios of intolerance between the components of the regional complex are weaker than those of constructive tolerance and co-operation, it remains a signal that until 1999 inter-ethnic and inter-confessional conflicts between Serbs and Croats were resolved through the use of weapons and ethnic cleansing.

One vulnerability of the area is also the entire history of territorial disputes and ethnic, cultural and religious conflicts. Overcoming this disability requires initiatives, but also economic, political and military instruments. It requires an activity of remodeling people's conceptions and mentalities, education in the spirit of respect for civic rights and freedoms, political and religious tolerance, multidirectional co-operation, cohabitation. As in the economic field, the cultural-educational approach, the initiative came from outside the societies and regional political actors, namely the EU and the OSCE, the founding institutions of the Security Pact.

Vulnerabilities reviewed turn into risks and are capable of becoming so many threats when their action is felt in the medium and long term, with increased degrees of intensity.

Developments in recent years have led to a change in the nature of the risks and threats to Romania in the river. Risks to national security, characteristic of the river area, can be grouped into risk factors of a political, social, economic, ecological and military nature¹⁸.

Risk factors of a political nature relate to: delaying the convening of a Danube conference (belonging to the riparian, coordinating the legislation with that of the Central Navigation Commission on the Rhine and bringing the Danube Commission's attributions to the technical level sub-inscribed to navigation and transport without tendencies of protectionism), the delay in redrawing the border on the Lower Danube, reopening the Serpent Island issue, the delay in the official recognition, by bi or trilateral treaty, of border changes at the Prut estuary, the application of discriminatory treatments by international bodies and Western countries towards some nations riparian of the Lower Danube, creating artificial conflicts by Danube riparian states in order to block the lower Danube segment and move economic interest to the Middle Danube, upstream of a so-called "health cordon", diplomatic reaction unrealistic to crisis or crisis-induced situations, emergence of imbalances in the degree of protection generated by membership of certain organizations only.

Among the social risk factors that affect Romania's interests on the Danube we can list: creating confessional borders and stimulating disputes in the river area to support the shift of economic interest, the exacerbation of the national revenge sentiments, maintaining the image of uncertainty and risk of business opportunities on the Lower Danube.

Risk factors of economic nature can be: blocking the transit of territories through restrictive measures, increasing the technological gap between the Lower Danube service systems and the Rin-Main logistics complex, delaying the development and technology of service systems on the secondary branches (Olt and Prut as tributaries) interconnected to the logistic corridor along the Lower Danube, increasing the technological gap within the Romanian service system on the Lower Danube, mainly between Constanța and the other ports, favoring transit and depriving domestic transport, the emergence of economic blockages.

¹⁸ Simona Frolu, *Securitatea națională în geopolitica integrării*, p. 89.

Other factors of an economic nature related to: economic gaps between states in the area, the organizational process of economic globalization that accelerated the riparian states of the Danube and the fierce desire of the big companies to occupy new markets, the construction of the Bistroe Canal by the Ukrainian authorities under economic motivation to break the Romanian monopoly over the high-capacity maritime traffic on the Danube and Ukraine's desire to supply it as raw material to the EU as a neighbor, the stake of the Danube tourism potential, the right of states to exploit their resources related to the Danube and the adjacent area, the struggle for the energy resources, which are the most important dimension, and the Danube riparian states.

Natural or environmental risk factors may be the following: the occurrence of large-scale natural disasters due to global climate change, which also affects the Danube area, earthquakes that can affect hydro-energetic dams and existing dams on the river, accidents of navigation or accidents to economic objectives near the river, which may cause massive leakage of petroleum/chemical products, accidents/damages at the Kozloduy and Cernavoda power plants, exploiting aquatic resources by using inappropriate means (in Ukraine fishing with electric means is authorized and recognized as a fishing method), the construction of the Bistroe Canal through a strictly protected area, with negative effects on the river and fauna of the Danube Delta.

For the next period, some risks and threats can be identified, such as:

- regional risks – strategic imbalances in the potential military in Romania's strategic interest area, the presence of military tensions and conflicts that may extend, the prolongation of economic and social difficulties that directly affect the military potential and erode the authority of the national state institutions, the possibility of malfunctions in the financial, computer, energy, communications and telecommunication systems of the states, politico-military rivalries between states;

- asymmetric risks that include those strategies or deliberate actions directed against the Romanian state that use different methods of classical struggle to attack vulnerable civil society but which may directly or indirectly affect the armed forces. They relate to the expansion of terrorist networks and activities, the uncontrolled proliferation and dissemination of nuclear technologies and materials, mass destruction, armaments and other unconventional means, the informational war, the isolation of Romania from the global information society, from the lack of specific infrastructure;

- transnational risks – those risks that cross the borders between states. Some of these may be generated by groups that promote separatism or extremism, others originate in inter-ethnic disputes, religious rivalries, and human rights violations. Organized crime, illicit drug trafficking, weapons are new risks.

- unexpected events – refers to risks placed in the uncertainty field and are based on objective and subjective factors. Good international relations, existing at present, may change or deteriorate and our region is not protected from this point of view.

Characterized by a wide variety of manifestations and by altering the order of priorities in the direction of shifting the emphasis from external to domestic, from conventional to unconventional, from direct to indirect, the potential risk factors for the national interests on the Danube have only one common element: they assume extensive international collaboration to evaluate and to reduce or cancel their effect.

Conclusions

Under the new international conditions, maintaining the status of master of the Danube mouths is fundamental for Romania both in its development and in the preservation of its own national security. Romania needs to use its geostrategic position to accelerate the development of its trade relations and not only. Currently, as a member of the European Union and of the

North Atlantic Alliance, it is fundamental for the Romanian state to consider: maintaining open navigation on the Danube, streamlining the traffic on the Danube-Black Sea Canal, ensure a more rigorous control of the Danube Delta and the mouths of the Danube, the establishment of a more severe regime of ecological protection of the part of the Danube basin belonging to our country, promoting initiatives to create broad Danube cooperation to jointly exploit the benefits of the direct link between the North Sea and the Black Sea, strategic reconsideration of river operations areas, establishment of an inland waterway network and their connection to the Danube River.

NATO and EU membership provides Romania with security guarantees in the context of a European and international political landscape, characterized by the existence of instability factors and the diffusion of new risks and threats. The new security risks imply a common approach and a concerted effort of all states that have the political capacity and willingness to contribute to their approach. Considering the position on Europe's main river transport through which it manages with its neighbors the lower course of the Danube, I appreciate that this gives our country the chance to become one of the largest river powers. But only an appropriate naval river policy and strategy can turn Romania's chance into reality.

Border control should contribute to combating deliberate armed and non-armed actions aimed at harming national security, arms trafficking, drugs, ammunition, explosives, illegal immigration, piracy and preventing any threat to the internal security of Member States EU. Since the maritime and river border area, which has become a border of the European Union, must be covered with maximum efficiency, it is necessary to cooperate as closely as possible with the Naval Forces, the Border Police and other structures of the National Defense System.

In conclusion:

- the geostrategic, economic, ecological importance of the basin and the size of the Danube area are the objective basis for defining the interests of the Romanian state in the river domain and for the elaboration and promotion of its naval policy;

- the river interests are part of the national, economic and political-military interests of the Romanian state being promoted through political, diplomatic, military and materialized by means of treaties, agreements, programs, projects and joint initiatives;

- the pursuit of Romania's economic interests and river communications, as part of them, is the objective support of the need to create credible river-borne forces capable of defending national interests on the Danube.

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THE INTERNATIONAL RIVERS AND THE SPECIFICS OF THE NAVIGATION OF MILITARY SHIPS ON INTERNATIONAL RIVERS

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Abstract:

“Water will be one of the most important natural resources in the future. The way it is treated will not only affect the lives and welfare of billions of people and will determine national economic strategies, but also directions for action in many regions of the world.

Poor access to clean drinking water already has a negative impact on national prosperity in most regions of the world. When water resources are cross-border, cooperative and integrated management is a major challenge with many obstacles. There is great potential for triggering conflicts due to water.

From the point of view of navigation, the following is necessary because the freedom of commercial navigation on international rivers is absolute in the sense that they have access to the river all countries' commercial vessels without any discrimination. Instead, military, customs and police vessels belonging to northern states are forbidden access to international rivers. This kind of ships can only access the river if they belong to riparian states, and only in their river section. In order to enter the river section of another riparian country, the written consent of the latter is required. ”

Keywords: *water; river; military ships; navigation; river; international rivers; legal regime; freedom of navigation.*

The well-known Romanian diplomat Constantin DIAMANDY considered that "if the geography of the Danube ends at its mouths, it economizes it flows into the Mediterranean Sea; in the Delta flows its waters, in the Mediterranean it carries its ships without free admission to the waters of the Mediterranean - this shows that the strategic importance of its mouths can not be separated from that of the strait Bosfor and Dardanele.

INTRODUCTION

Statistically, 71% of the planet's surface is covered by water, 97% being large and oceanic, so there is little room for commercial, industrial, agricultural and domestic use. Of the remaining three percent of the water, more than two percent are contained in the polar pond, glaciers and deep-sea subsoil which are inaccessible. It is estimated that only 0.36% is found in rivers and lakes. This shows that a very small percentage of water is found in waterways that are of great economic importance. In a normal year, inland waterway transport in Europe accounts for approximately 500 million tones of transported goods. We are currently witnessing a process of crystallization of an international river law as an integral

part of public international law. As Edwin Glase defines it, it is the set of rules and institutions of international law governing the relations between states with regard to the use of non-Maritime international waters. The international watersheds are those watercourses that cross or separate two or more states, being navigable to the sea and under an international convention, they are open to the navigation of merchant ships of all States. The Danube is part of this category, the regulation of the international navigation regime on the Danube, was made by the Paris Convention of 1856, which provides freedom of navigation on this river for all merchant ships and the suppression of the tax on the fish. The international river law is not limited to regulation of river navigation, but it also regulates other activities of states in this field, such as the use of these rivers as sources of energy or irrigation, as well as the problem of preventing the pollution of the river waters. Establishing a regime of navigation freedom on a river does not mean limiting the sovereignty of riparian states if it is the expression of the sovereign will of these states. This fact has been formally recognized since the Congress of Vienna in 1815, in whose documents it was foreseen: A watercourse does not lose its character of territorial and national water by the fact that it is considered an international way of navigation. Riparian states retain all the rights resulting from their sovereignty over their national sector and also have certain obligations to ensure the airworthiness of the river in this sector.

TERMINOLOGICAL PRECISION AND CONCEPTUAL DELIMITATIONS

Proper understanding of the evolution of the legal status of international water courses and the protection of their sustainable use presupposes, first of all, the correct definition of the instruments we operate with. It should be noted that the definition of the international river term was given for the first time at the 1815 Congress in Vienna, although the concept was known in advance – freedom on international rivers had been stipulated by the Westphalic Treaties (1648) or the Ferrara Pact (1177) concluded between several Italian-state cities on the Pad River. The international regime of these rivers generally refers to navigation, for which the principle of freedom of navigation applies according to international conventions.

By the notion of international rivers, whether these are called international rivers or international watercourses, they mean those flowing waters that cross or separate the territories of several states and which are navigable until their discharge into the ocean/sea.

The rivers that cross the territories of several states are called successive rivers. Example: the Danube for Germany, Austria, Hungary, Serbia, Montenegro and Romania or the Niger, for Guinea, Mali, Niger and Nigeria.

The rivers separating the territories of several states are called contiguous rivers. Example: The Danube for Slovakia and Hungary, for Romania and Bulgaria; the Rhine for Germany, Switzerland and France.

The principle of freedom of navigation on international rivers is enshrined in the Final Act of the Vienna Congress of 1815, which proclaims the general principle of freedom of commercial navigation on major international rivers.

The 1921 Barcelona Conference, convened under the auspices of the League of Nations, introduces the concept of a "navigable watercourse of international interest", which considered it to be considered also the possible tributaries of an international river, justifying in legal terms the participation of some riparian states to the establishment of the legal regime and the exploitation of some international rivers, most of them with disregard for the interests of some riparian states.

THE LEGAL FRAMEWORK OF INTERNATIONAL RIVERS

According to international law regulations and the legal regime for different rivers in Europe, America, Asia and Africa, some conclusions can be drawn.

First, depending on their legal regime, the rivers can be divided into two categories, rivers with legal regulation through bilateral conventions (Escaut, Rio Grande de Norte, Indul) and rivers with legal regulation through multilateral conventions (Danube, Rhine, Niger).

Secondly, with regard to the object of activity requiring legal regulation, concerning some rivers, they are divided into: multi-regulation rivers: navigation, hydropower, irrigation, etc. (Danube, Rhine, St. Laurent) and rivers whose regulation only refers to one aspect of their use (navigation for the Rio de la Plata, irrigation for the Ind).

Thirdly, from the point of view of establishing a common body to contribute to the practical implementation of legal instruments regulating the legal regime of rivers, they are divided into: rivers that have formed a Joint Commission or other co-operation and oversight body on the fulfillment of the various legal instruments (the Danube, the Rhine, the Niger); rivers that do not have such organism (the Ind, the Senegal, the Nile).

The diversity of situations and interests that the international rivers present from the geographic, economic and historical point of view have so far made it impossible to adopt a set of unanimously accepted rules on navigation on these watercourses.

However, some common rules on navigational freedom and the rights of riparian states in the use of international rivers can still be identified today: freedom of navigation on international rivers, which entails ensuring the unimpeded access of merchant ships of all States, riparian or non-verbal. Commercial vessels will be treated equally, irrespective of the flag they fly. Military ships, as well as customs and police of river states, do not have access to international rivers. The same category of ships in the riparian states enjoy the right to navigate these rivers, but only in the sectors subject to the sovereignty of the states to which they belong.

Access to sectors of other states is only allowed with their authorization. The right of riparian States to determine the conditions for the conduct of navigation in agreement with the other riparian States and their obligation to keep the river in a state of navigation by carrying out maintenance and fitting-out works. The riparian states also exercise the right to customs and sanitary and oversight by the river police, as well as to charge certain taxes.

From the regulations of the international law on the navigation regime on certain rivers, some general characteristics of it, namely: riparian states are sovereigns on their national river sector and competent to regulate freedom of navigation on it; freedom of navigation on a river means that all merchant ships, irrespective of their flag, have free access to the river and to certain ports of that river. The military ships of the riparian states may navigate a river only within the limits of their national sector, and the naval vessels of the river states do not have the right to penetrate these rivers; riparian States have the obligation to maintain the airworthiness of the river in the national sector, and for maintenance work they may charge certain taxes from foreign ships; the right of riparian States to determine the conditions for the conduct of navigation in agreement with the other riparian States and their obligation to maintain the river in a state of navigation by carrying out maintenance and fitting-out works. The riparian states also exercise the right to customs and sanitary and oversight by the river police, as well as to charge certain taxes; in the case of transit navigation, the rule accepted on international rivers is that, in such cases, consignments are not controlled by the customs authorities of the State of transit except for the existence of a presumption of fraud or contravention to that State; river surveillance, sometimes called "river police", is carried out by riparian states in order to monitor and control compliance with the navigation rules, with the obligation to ensure the order and safety of navigation and the preservation of hydropower and port constructions.

SPECIFIC FOR THE LEGAL REGIME OF INTERNATIONAL RIVERS

EUROPEAN RIVERS

Concerning the European continent, the Hague Treaty of 1795, which regulated the freedom of navigation on the Rhine, Escaut and Meuse, and in 1797 the Treaty of Campo-Formio by which France and Austria enshrined the freedom of navigation on the rivers

international interests of common interest, including the Rhine. Thus, there is a growing emphasis on the principle of freedom of navigation, which culminated in the Congress of Vienna in 1815. The final act adopted on this occasion was to constitute, for almost a century, the Book of River Law, because it clarified some controversial issues until then. This legal act defined the notion of international river, laid down the general principles applicable to all international rivers, the regulation of the principle of freedom of commercial navigation and, last but not least, the legal status of the Rhine. Since then, no state has been able to oppose free access to international water courses without being sanctioned. Also, due to the general consecration of the principle of freedom of navigation, acts adopted later have taken this principle as a hypothesis, developing new ideas aimed at improving river traffic conditions. The Vienna Final Act is by far the best and most comprehensive act ever before, even though it was meant to be more a framework regulation, on the basis of which the riparian states regulate their own legal regimes of navigation. From the point of view of river law, the twentieth century began with the Versailles Fathers' System (1919), among which the problems concerning the use of international watercourses were made. Until this moment, the Rhine was the main interest of Western countries, and the Danube was deliberately omitted at the Vienna Congress, we notice the tendency of states to turn their attention to the Danube. From the content of par. 2 of art. 338 of the Treaty of Versailles shows that only four rivers are internationalized: Elba, Oder, Niemen, the Danube. The development in the near future of a general convention applicable to all international watercourses. This was done in 1921, by signing the Barcelona Convention, a statute and an additional protocol - regulating the legal and navigational regime of all international riverways. The Barcelona Convention also required the signatory States to grant each other the freedom of navigation on the waters under the sovereignty of any of them.

AMERICAN RIVERS

As a result of British domination in Canada, the idea of navigational freedom on international rivers has been actively promoted by the British Empire, especially in relations with the United States. The imposition of the idea of freedom of navigation on North American rivers has, in every case, led to contradictory discussions between American and European colonial states. It is the case of the collision between the US States and Spain, on the one hand, for the freedom of navigation on the Mississippi (1795), and on England, on the other hand, on the freedom of navigation on St. Laurentiu (1854). As to the specificities of the American rivers, one can see the tendency of the continent's states to introduce the smallest parts of the rivers into the international regime, examples being the US-Canadian practice of allowing navigation only for their citizens, as well as the Columbia River was internationalized only on one arm. There are three characteristics of the American rivers, namely: the overwhelming interest of rivals, so that the rivers were subject to internal regulation, and very rarely, as in the case of the Amazon and Paraguay subject to bilateral regulation; the liberal character of regulations - the Panama and Uruguay rivers are open to all states; exclusive riverine management of rivers.

It is also worth mentioning that, with regard to the regulation of river navigation, the system adopted and practiced in America is not identical to the system in Europe where countries are guided and conforms to a common and general treaty such as that of Vienna in 1815. In America, states have concluded bilateral treaties, ultimately reaching the same result, namely freedom of navigation on international rivers. The influence of the ideas of the French Revolution as well as of the Congress of Vienna, however, has been one of the most important roles in establishing freedom of navigation on the American continent, although there are voices in the doctrine that "US shipping regulatory practice reveals a evolution and approach totally different from that encountered in Europe".

The specificity of the legal regime of these rivers is given by the very nature of the watercourses. These are the most capricious, characterized by seasonal fluctuations and course changes, which have led to frequent regulations regarding the possibility of riparian states to divert the watercourse. This trend was also due to the prevalence of US water use for irrigation purposes. A telling and unique example in international history is the case of El Chamizal, which successively passed from US sovereignty to Mexico, as a direct result of Rio Grande del Norte (Rio Bravo) river change.

ASIATIC RIVERS

Although there are few references to the Asian watercourses in the literature, there may be some peculiarities that are likely to establish broadly the legal status of the continent's rivers. The legal regime on the Asian continent's rivers is marked by bilateral regulations, the lack of river commissions to oversee the fulfillment of rules set by different legal rules and the lack of impact of the Vienna Act. From this point of view, it is worth noting the exclusivity of irrigation regulations and the tendency of the more advantageous debit states to impose their own will on less-favored states. This has given rise to various international disputes over time, among which the most significant one opposed India and Pakistan in connection with the use of the Indus. India's privileged geographical position was also found in the 1960s Karachi Treaty, which stated that India accounted for 80% of the basin's waters, while Pakistan's only 20%. In the next period, it was also in India that concluded a treaty with Nepal in 1996 on the distribution of the waters of the Mahakali River and which favored its interests and did not actually ensure a fair allocation of resources and benefit. No other states have been foreign to conflicts over the use of watercourses, also for irrigation purposes. This is the case between Afghanistan and Iran on the Helmand River that has raised the issue of arbitration on two occasions. Each time they received fairness considerations in the use of river waters, stating that the use must be such as to be without prejudice to the flow reduction for the other State Party. In 1893, all Afghanistan was involved in another dispute, this time with Turkmenistan, on the division of the Kushk River.

There is, therefore, a strong tendency of the riparian states of the Asian continent to gain advantages from their privileged position on the river.

Analyzing the main continental watercourses, we find this practice everywhere. This state of affairs has led to fragmented regulations, not including all river basins, in most cases unfair and sources of ongoing disputes between states.

AFRICAN RIVERS

The colonial regime that existed throughout Africa has brought a strong European influence on the legal status of the watercourses on this continent, and as such a unique and naturally more advanced legal regime. Thus the freedom of navigation on the Congo and Niger rivers, as well as their tributaries, was clearly established and guaranteed both for the riparian and the non-riparian states, without any distinction, though initially by signing the Treaty of Saint-Germaine, the freedom of navigation for merchant ships was recognized only by the signatories of the treaty, and later by members of the League of Nations.

The general characteristic of the African rivers is given by their specificity, namely difficult navigation on stretched portions, so that there is a need for the internationalization of roads, railways and sideways, which are considered as accessories of the river. This state of affairs is found only on the territory of African countries and is also a consequence of the colonial regime. It should be noted that this method is not at all equitable and even less advantageous, but because the interest of the colonial states was that the largest part of the territory of another state was internationalized, this method was used. Another important feature is that the colonial states that were riparian of a river tended to pull out the largest parts of it from the international regime. This is the case for France on the Senegal and

Portugal on the Zambei River. This trend has also been preserved in African states shortly after decolonization.

It is also noticed that for rivers where the interest of European states was higher, there is also the tendency of setting up river commissions – prepared to supervise compliance with the rule of law. This is the case for the Congo – whose committee has never seen the light of day, so there are no river commissions in Africa. Only in the years 1973 and 1979, with the revision of the Act on Navigation and Economic Cooperation between the Niger Basin States of 1963, the Niger River Commission was established, which received the status of an international organization.

One of the most important differences in the legal regime of the river, between the European and the African one, is the free access of the riverine or non-naval military ships to the African international rivers, even during the war. As has been shown before, there is nowhere in the world any legal norm to allow non-naval military ships to access an international watercourse. Maximum permissibility is provided for military ships of riparian states that may enter a section other than their own, but only subject to prior approval.

MAIN COURSES OF INTERNATIONAL WATER¹

EUROPE²

No. crt.	Stream	Length	Countries crossed
1	DANUBE	2.860 km	Germany, Austria, Slovakia, Hungary, Croatia, Serbia, Bulgaria, Romania, Republic of Moldova, Ukraine.
2	ELBA	1.091 km	Germany, Czech Republic.
3	ESCAUT	350 km	France, Belgium, Netherlands.
4	MEUSE	950 km	France, Belgium, Netherlands.
5	ODER	866 km	Czech Republic, Poland, Germany.
6	RIN	1.230 km	Switzerland, Germany, Netherlands.
7	VISTULA	1.047 km	Poland, Belarus, Ukraine, Slovakia.

NORTH AMERICA³

No. crt.	Stream	Length	Countries crossed
2	RIO GRANDE DEL NORTE	2.870 km	United States of America, Mexico.
3	St. LAURENT	3.100 km	United States of America, Canada

SOUTH AMERICA⁴

No. crt.	Stream	Length	Countries crossed
1	AMAZON	3.998 km	Brazil, Colombia, Ecuador, Peru, Bolivia
2	PARANA	3.100 km	Brazil, Paraguay, Argentine
3	RIO DE LA PLATA	320 km	Argentine, Uruguay

¹ Source conformable <https://www.globi.ro/recorduri/cele-mai-lungi-fluvii-din-lume> accesed on 12.02.2019.

² Source conformable <https://ro.wikipedia.org/wiki/Listă-de-fluvii-din-Europa> accesed on 12.02.2019.

³ Source conformable <https://ro.wikipedia.org/wiki/Listă-de-fluvii-din-America> accesed on 13.02.2019.

⁴ Source conformable <https://ro.wikipedia.org/wiki/Listă-de-fluvii-din-America> accesed on 15.02.2019.

ASIA⁵

No. crt.	Stream	Length	Countries crossed
1	INDUS	3.200 km	Pakistan, India, China
2	MEKONG	4.500 km	China, Myanmar, Laos, Thailand, Cambodia, Vietnam
3	GANGUE	2.511 km	India, Bangladesh

AFRICA⁶

No. crt.	Stream	Length	Countries crossed
1	CONGO/ZAIRE	4.320 km	R.D. Congo, R. Centrafricana, R. Congo, Angola, Zambia, Tanzania, Burundi, Rwanda
2	NIGER	4.160 km	Guinea, Mali, Niger, Benin, Nigeria.
3	NIL	6.671 km	Sudan, Egypt.
4	SENEGAL	1.430 km	Senegal , Mali, Mauritania, Guinea
5	GRIN	2.660 km	Zambia, Angola, Namibia, Botswana, Zimbabwe, Mozambique

CONCLUSIONS

Water will be one of the most important natural resources in the future. The way it is treated will not only affect the lives and well-being of billions, but will also determine national economic strategies, but also directions for action in many regions of the world.

Poor access to clean drinking water already has a negative impact on national prosperity in most regions of the world. When cross-border water resources, cooperative and integrated management is a major challenge with many obstacles. There is great potential for triggering conflicts due to water.

One of the most important mechanisms to prevent "water wars" is to establish clear rules. The 1997 Convention has made much of the necessary steps for it. The basic principle of fair and reasonable use determines the scope of action and gives each State an opportunity to present its situation. All relevant factors have to be weighed to determine what a fair use means.

Clearly, the resolution referred to is one that has been reached through understanding. When each party knows that its point of view will be investigated and taken into account, it will be easier to compromise. The recent state of play with the international treaties on cross-border waters calls for and supports the approach of the 1997 Convention.

For countries bordering on waters that have voted against or not, are parties to water agreements, they will act the persuasive weight of the international community. It is up to the international community to accept and apply the rules outlined in 1997. This would be in line with a practice already in place and would contribute to the peaceful management of international water courses around the world.

From the point of view of navigation, the following clarification is necessary because the freedom of commercial navigation on international rivers is absolute in the sense that they have access to the merchant vessels of all states without any discrimination. Instead, military, customs and police ships belonging to northern states are forbidden access to international

⁵ Source conformable <https://ro.wikipedia.org/wiki/Listă-de-fluvii-din-Asia> accessed on 15.02.2019.

⁶ Source conformable <https://ro.wikipedia.org/wiki/Listă-de-fluvii-din-Africa> accessed on 17.02.2019.

rivers. This kind of ships can have access to the river only if they belong to the riparian states, and only in their river section.

In order to enter the river section of another riparian country, the written agreement of the latter is required.

For a better understanding, the main legal regulations on navigation on international rivers are summarized in the following table.

TYPE OF SHIP	PAVILION STATE OF THE SHIP	FREEDOM OF NAVIGATION	RIVER/SECTION RIVER
Commercial	riparian	Absolute	Across the river
Commercial	Non-riparian	Absolute	Across the river
Military, customs, police	Non-riparian	Partial	Only in the river section
Military, customs, police	Non-riparian	-----	-----

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BLACK SEA FLEET PARTICIPATION IN THE SYRIAN WAR

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Abstract:

Since the beginning of Russia's military operation in Syria, launched on September 30, 2015, ships of the Black Sea Fleet have actively participated in actions under permanent Task Force of the Russian Navy in the Mediterranean Sea. This operation is the first in the history of post-Soviet Russia, when Russian troops participate in fights outside the former Soviet Union. One of the main tasks of the Russian Navy was logistical support by transporting ammunition, fuel and lubricants, and other materials necessary for the conduct of hostilities. At the same time, the Russian Navy has been assigned with the following battle tasks: naval gun fire support of ground actions, protection of the Russian bases against actions from the sea, control of the sea lines of communications in the eastern Mediterranean. The experience gained by the Black Sea Fleet and beyond, while waging military actions will have an impact on the Russian military thinking and technological development. At the same time, this new type of action of the Black Sea Fleet must be taken into account especially by the states bordering the Black Sea, including Romania.

Keywords: *Black Sea Fleet; The Russian Federation; Syrian war; operation; tasks.*

"The Russian Navy is being equipped with the newest; including precision long-range strike weapons, and has big nuclear power. Naval forces today are capable of operating for a long time and with high combat readiness in operationally important areas of the global ocean."

Admiral Viktor Chirkov, former Commander-in-Chief, Russian Navy

Introduction

The purpose of this article is to make a short presentation of the Russian Federation's involvement in the Syrian conflict, its reasons and its medium and long-term implications. The main objective outlined in this article is to highlight the active participation of the Black Sea Fleet in this joint operation and to present the gradual phases of its use before the official commencement of the Russian operation on Syrian territory and after the operation was launched. This joint operation was the first in the history of post-Soviet Russia, when the Russian troops participated in battles outside the former Soviet Union.

Throughout the article, we will present conclusive data to demonstrate the involvement of the Russian Federation, especially the Navy, in the Syrian civil war before the formal declaration of participation. These facts confirm once again that the Kremlin's interference with the internal affairs of certain states is real.

At the same time, the Russian Naval Forces, by participating in this operation, have accumulated an extraordinary experience on the battlefield, which will have an impact on the strategic and operational environment of the Mediterranean as well as on the Black Sea connected both geographically and in terms of interests, which must be recognized and studied by the military, political and academic entities of Romania.

Interests of the Russian Federation in Syria

The Syrian conflict broke out in February 2011, in a hot regional context, marked by numerous riots from the Arab states against the political-military leadership regimes. We will not talk about the reasons for the outbreak or its evolution, but we will analyze the "need" for the Russian Armed Forces to intervene in this conflict.

Since the Soviet Union, Syria has been in the influence zone of this colossus. In the early 1970s, based on a Soviet-Soviet bilateral agreement, Tartus Harbor established and subsequently developed the 720 Logistics Centre for the 5th Soviet Navy Operational Group. Subsequently, the Russian Federation retained its own elements at this point, considered an important outpost to offer the Russian Naval Forces exit to the "warm waters" of the Planetary Ocean. After 2008, the Russian Federation resumed talks with the Syrian side on the development of the outpost and the establishment of new bilateral agreements to allow Russian military ships to be stationed in this Syrian port.

During the same period, Syria signed a major arms purchase contract with the Russian Federation consisting of: the acquisition of two MiG-29 multi-aircraft squadrons, the renewal of the anti-aircraft defense system with a S1E Pantsir system, the acquisition of Iskander tactical missiles and two submarine Amur 1650. According to an article published by the Stockholm International Peace Research Institute, Syrian arms contracts with the Russian Federation amounted to at least \$ 4 billion in 2011. New York Times writes that between 2000 and 2010, the value of the contracts amounted to \$ 1.5 billion, turning Syria into Russia's largest armaments customer.¹

In this time, Russia's exports to Syria totaled \$ 1.1 billion in 2010, and its investments in this country were estimated at about \$ 20 billion (including \$ 4 billion in arms). In this context, the following can be mentioned: involvement of Stroitransgaz in major projects involving the construction of a natural gas distribution network of 200 kilometers; Tatneft, a subsidiary of Gazprom, through a joint venture with the oil company of Syria has started exploring a petroleum field and Aeroflot airline, which maintains Syria's civilian fleet.

Among the reasons why Russia has a firm stance on the issue of Syria can be remembered: firstly, Russia has great interests in the Middle East, at present Russia remains the largest arms dealer for Syria, as we have shown above, and second, from a geopolitical perspective, Russia does not want the countries that created an alliance with it to be defeated by the US.

From this brief description it can be inferred that the Russian Federation has major politico-economic-military interests in this state and region, but this is not the subject of study of this paper. The main objective will be found in the subsequent.

Triggering operation

The start of the "official" military intervention of the Russian Armed Forces takes place on September 30, 2015, when the State Duma approached Russian President Vladimir Putin's request to launch a military operation in Syria. Within a few hours the first air strikes are executed by the Russian Air Force on the positions of the Syrian rebels and ISIS. From this moment, the Russian Federation intervention becomes obvious and official, and the role

¹ <http://www.contributors.ro/fara-categorie/criza-siriana-in-fata-unui-dezastru-de-proportii/>, accessed January 21, 2019.

of the Russian Federation's Naval Forces, and especially of the Black Sea Fleet, will become important for this joint operation. In the following paragraphs, we will analyze and debate the role of the Black Sea Fleet in the conflict in Syria, known as the Syrian War.

Russian Federation's Naval Forces have been involved in this conflict before the onset of military intervention. In March 2013 under the signature of Defense Minister Sergei Shoigu a Permanent Task Group of the Navy in the Mediterranean was set up under the responsibility of the Black Sea Fleet Commander, hereinafter referred to as the Mediterranean Task Group. At that moment, the defense minister said: "A wide range of tasks is assigned to this naval group to ensure the naval presence of Russia in the Mediterranean. All of this will protect our national interests in such a turbulent region today"². This Task Group has become fully operational in the area of responsibility since September 2013, taking on the experience and missions of the 5th Soviet Navy Operational Group that was operational during 1967-1992.

Its purpose was to support the joint operation of the Armed Forces of the Russian Federation in Syria and to regain the Strategic-Operational Interests of the Russian Federation in the Mediterranean. "The invaluable experience of organizing, planning and using the forces of the 5th Mediterranean Operational Group has not only been lost, but today it finds its application in the work of staffs at all levels. From 2013, the Russian Federation's naval presence in the eastern part of the Mediterranean Sea has been completely restored and is underway", Admiral Vladimir Korolev, commander of the Russian Naval Forces at a conference in Sevastopol in July 2018.³

In the structure of the group can be entered between 10-20 ships, depending on the complexity of missions and can be ships from different fleets of the Russian Naval Forces. From 2013 onwards, over 40 boats were involved in that group. Also, the commanding ships of the group were from various fleets of the Russian Navy, so the first commander ship was the Udaloy Class anti-submarine destroyer "Admiral Panteleyev," belonging to the Pacific Fleet. Succeeding aircraft carrier "Admiral Kuznetsov", nuclear-powered cruiser "Pyotr Velikii", cruisers "Moskva" and "Vareag" and the new frigates belonging to the Black Sea Fleet "Admiral Grigorovich" and "Admiral Essen". The main tasks assigned to this Task Group are: anti-submarine defense, air defense, close and long-range surface coverage, anti-missile defense, humanitarian missions, search and rescue missions. It is also intended to respond to new threats: the prohibition of drugs and arms trafficking at sea, the fight against maritime terrorism and maritime piracy.

It can be clearly noticed that this region is important for the Kremlin administration and that it wants to design strategic interests, and the role of the Black Sea Fleet becomes important for achieving the proposed objectives.

Logistic support

A first mission of logistic support to the Task Group of the Mediterranean was to ensure the security of the chemical weapons removal operation in Syria from January to June 2014. Also during this period transport vessels in composition of Mediterranean Task Group

² «На оперативное соединение ВМФ возлагается широкий круг задач по обеспечению военно-морского присутствия России в Средиземном море. Все это позволит обеспечить защиту наших национальных интересов в таком беспокойном, тревожном в настоящее время регионе» https://function.mil.ru/news_page/country/more.htm?id=11769044@egNews, accessed February 19, 2019

³ Admiral Vladimir Korolev, during the scientific and practical conference in Sevastopol, June 1, 2019, «Бесценный опыт организации планирования и применения сил 5-й средиземноморской эскадры не только не утрачен, но и сегодня находит свое применение в работе штабов всех уровней. С 2013 года полностью восстановлено и осуществляется на постоянной основе военно-морское присутствие Российской Федерации в восточной части Средиземного моря», from site <https://regnum.ru/news/2424614.html>, accessed February 25, 2019.

executed logistical support missions by transporting the necessary ammunition, fuel and lubricants, and other materials, supporting Bashar al-Assad regime by renewing constantly "inexhaustible military reserve" of the Assad regime, so maritime traffic from the Russian Federation and Syria becomes a "way of life" for them. Using Russian military ships in these transports proved to be compelling because the support given to Syria was visibly unlawful and violated international conventions. The Russian Federation also had the option of using commercial vessels, but they are subject to the naval regulations in force so that a possible inspection of such a ship would risk an international scandal.

The shortest route from the Russian Federation to Syria is from the Black Sea through the Bosphorus and Dardanelles in the Aegean and eastern Mediterranean. For this reason, the Sevastopol-Novorossiisk-Bosfor-Dardanele-Latakia/Tartus route has become a standard route for this mission. However, the main port where loading the ships is Novorossiisk because it has land connections with better in Russia, but this increased march ships based in Sevastopol 1 day so that the total duration of a march from Russia to Syria became 5 days.

To analyze and quantify the Russian military vessel traffic through the Bosphorus, we used information from the Turkish site Bosphorus Naval News. Data published on this site are incomplete, but according to the owners of this site are processed up to 90-95% of all crossings warships through the Bosphorus.

Thus, to perform the logistic support of Bashar al-Assad regime, the Russian Navy used large amphibious ships also coming from of the Black Sea Fleet, which has seven such ships included in 197 Amphibious Ships Brigade: "**Nicolai Filcencov**", "**Orsk**", "**Saratov**", "**Azov**", "**Novocerkasc**", "**Tsezar Kunikov**" and "**Iamal**". It is noteworthy that in Sevastopol there is still a Ukrainian amphibious ship "Konstantin Olshansky" captured by the Russians during the Crimean occupation, but so far the Russian Federation has not dared to use it for transportation to Syria.

To achieve the objectives set, the Russian Navy supplemented group transport for this operation amphibious ships from other fleets, as follows: 4 of the Baltic Fleet 3 Fleet Nordic 2 of the Pacific Fleet.

Between 2013-2015, there were over 300 passages of Russian ships through the Bosphorus in both directions. Several ships of all Russian military fleets participated in the campaign in Syria and crossed the Bosphorus. Of these, at least 14 amphibious ships out of the 18 in service, such as: 5 of the Black Sea fleet, 4 of the Baltic fleet, 3 of the Nordic fleet, 2 of the Pacific fleet.

Share amphibious ships of all Russian ships that passed through the Bosphorus accounted for over 70% (229 out of 303 passes). Amphibious ships of the Black Sea Fleet represent more than half of all Bosphorus passages, more than 20% were executed by the Baltic Fleet ships and about 10% of the Northern Fleet ships. The data retrieved on the website mentioned above was an increase in ship traffic carried by Russian amphibious ships, as follows: in 2013 – 29 trips, 2014 – 46 and 2015 – 67. In table no. 1 are detailed on ships the number of marches executed during this period.

It is worth noting that on the way to Tartus the ships are fully loaded - the waterline in the photos is barely visible. And in the photos taken during the crossing of the Bosphorus to the Black Sea, the waterline is visible – the ships are almost empty.

Data on the nature of the cargo is missing, and since the summer of 2015, Russian amphibious ships have begun to pass through the Bosphorus with equipment that has been installed even on their deck, covered with awnings or camouflage nets. We can deduce that the materials embarked on Russian ships should not have been known by public opinion or by authorized institutions until the beginning of the joint operation.

Table no.1 Marches executed by the amphibious ships of the Russian Navy in Syria during 2013-2015 (September)

Amphibious ship	Fleet	Year	Marches
Admiral Nevelskoy	Pacific Fleet	2013	1
Aleksandr Shabalin	Baltic Fleet	2013	5
Azov	Black Sea Fleet	2013	4
Kaliningrad	Baltic Fleet	2013	5
Minsk	Baltic Fleet	2013	3
Nikolay Filchenkov	Black Sea Fleet	2013	4
Novocherkassk	Black Sea Fleet	2013	3
Peresvet	Pacific Fleet	2013	2
Iamal	Black Sea Fleet	2013	2
Aleksandr Otrakovskiy	Northern Fleet	2014	1
Aleksandr Shabalin	Baltic Fleet	2014	1
Azov	Black Sea Fleet	2014	3
Georgiy Pobedonosets	Northern Fleet	2014	5
Kaliningrad	Baltic Fleet	2014	10
Minsk	Baltic Fleet	2014	2
Novocherkassk	Black Sea Fleet	2014	9
Olenegorskiy Gorniyak	Northern Fleet	2014	3
Saratov	Black Sea Fleet	2014	4
Iamal	Black Sea Fleet	2014	8
Aleksandr Otrakovskiy	Northern Fleet	2015	9
Aleksandr Shabalin	Baltic Fleet	2015	5
Azov	Black Sea Fleet	2015	8
Korolyov	Baltic Fleet	2015	8
Nikolay Filchenkov	Black Sea Fleet	2015	8
Novocherkassk	Black Sea Fleet	2015	10
Saratov	Black Sea Fleet	2015	6
Tsezar Kunikov	Black Sea Fleet	2015	8
Iamal	Black Sea Fleet	2015	4

Since September 2015, the Mediterranean Task Group's logistic support mission has become "official" due to the need to supply the Russian Armed Forces involved in the conflict in Syria. Thus, at the "invitation" of the Syrian president, starting in 2015, Logistics Section 720 of Tartus is undergoing a vast process of modernization and transformation into a naval base. In December 2016, an agreement was signed between the Russian Federation and Syria on extending the territory of Logistics Section 720 of Tartus harbor and granting Russian Federation military vessels access to the territorial sea, the internal waters and the Syrian ports.⁴ After modernization, the plans stipulate that one of the berths will be able to receive a first rank ship (cruiser or destroyer), and the second - two ships of the second rank (the frigate or desert ship). We can deduce that the Russian Federation is developing its principal and at the same time the only maritime outpost that allows it to get out of the "warm waters" of the Planetary Ocean.

Gun fire support

The gun fire support of the joint operation and the striking of important military and economic objectives on Syrian territory was accomplished by the Russian Federation's Naval Forces by executing strikes with the Kalibr NK and Kalibr-PL missiles, especially through deep-land attacks, and through naval aviation raids from the aircraft carrier "Admiral Kuznetsov" or from the air base of Hmeimim in Latakia province.

⁴ <http://www.kremlin.ru/acts/news/53577>, accessed February 19, 2019.

The first missile strikes were carried out at night between 6 and 7 October 2015, when a group of ships from Caspian fleet launched 26 Kalibr NK missiles on 11 targets across Syria. Missile trajectory passes over the territory of Iran and Iraq and has a length of 1400 - 1500 km. As a novelty is the launch platform which was represented by small vessels, corvettes class Buyan-M Project 21631. These have shown that small vessels can accomplish naval gun fire support missions from a long distance and should be taken in consideration. Professor of joint military operations at the US Naval War College, Milan Vego state: "The US Navy and other navies, blue water navies, really have to pay more attention to what is going on. These smaller ships are less than 1,000 tons. It is very dangerous to be dismissive, especially in smaller straits where they can do a lot of damage."⁵. On November 20, 2015 Caspian Flotilla ships have executed a new missile attack on targets in Syria, being a total of 18 Kalibr NK missiles launched.⁶

Followed strikes was taken from the eastern Mediterranean by submarines and surface vessels. The trajectory, in this case, passes over Syrian territory and has a length of only 400-900 km. As surface vessels used in missile strikes stand out frigates "Admiral Grigorovich" class from the Black Sea Fleet organization. Overall, according to reports from open sources, during the battles, surface ships made about 25 launches with a total consumption of more than 140 Kalibr NK missiles. Submarines have been involved in missile strikes on targets in Syria since the end of 2015. Were used only Kilo class submarine project 636 Varshavyanka, also from the Black Sea Fleet and were executed 12 launches with approximately consumption of 40 Kalibr-PL missiles.⁷

The first attack by a submarine was executed on 8 December 2015 by the B-237 submarine, Rostov na Donu, on targets in the province of Raqqa.

On August 19, 2016, from eastern part of the Mediterranean Sea were launched three Kalibr NK missiles by two Buyan-M class corvettes from the Black Sea Fleet against to the Nusra Front objectives.⁸ This strike was followed by an attack executed by the frigate "Admiral Grigorovich," which is the first mission of its kind, on November 14, 2016.

From the point of view of naval aviation involved in this operation, between November 8 and the end of the year in Syria's coastal area operated the single Russian Navy aircraft-carrier. After an adventurous march, highlighted by the Western press, it operated for about 2 months, in which, according to the statistics from open sources have been executed 420 combat missions out of which 117 in the night time and 750 of training flights and escorting missions of transport aviation. According to data written in Russian press, flights were performed in different weather conditions and during the combat missions more than 1,000 targets on Syrian territory were attacked, destroyed or deactivated.⁹

These strikes have highlighted the capacity of the Russian Armed Forces to perform joint level operations using: onshore forward observation positions, naval forces capable to launch cruise missiles and naval or ground based aviation to achieve the objectives.

810 Marine Infantry Brigade under the Black Sea Fleet command were participated in the conflict since the moment when the joint operation was started (October 2015) with the main mission of guarding and protecting the Hmeimim air base and port of Tartus. In the search and rescue operations of the Russian Su-24 aircraft pilot shot down by the Turkish army, the marines had specific tasks for this type of mission.

⁵ Christopher P. Cavas, "Is Caspian Sea Fleet a Game-Changer?" Defense News, 11 octombrie 2015, <https://www.defensenews.com/naval/2015/10/11/is-caspian-sea-fleet-a-game-changer>, accessed February 19, 2019.

⁶ <https://tass.ru/spec/syria>, accessed February 21, 2019.

⁷ Sivcov Constantin " «Калибр» на час В Сирии всплыли все проблемы отечественного флота", 26 decembrie 2017, <https://vpk-news.ru/articles/40592>, accessed February 19, 2019.

⁸ https://function.mil.ru/news_page/country/more.htm?id=12093238@egNews, accessed February 21, 2019.

⁹ <https://structure.mil.ru/structure/okruga/north/news/more.htm?id=12110822@egNews>, accessed February 21, 2019.

Other important tasks assigned to the Mediterranean Task Group, protection Russian bases across Syria against actions from the sea and control of the sea lines of communication in Eastern Mediterranean were fulfilled by the battle ships under their command. The mentioned Task Group is composed of various types of surface combat ships that cover all naval warfare environments, transport vessels for specific missions and supporting ships for their own logistical support. This was highlighted by the same admiral Vladimir Korolev who states: "The composition of the group operating in the Mediterranean, can be flexibly changed depending on the tasks. The group is self-sufficient and includes ships equipped with precision weapons."¹⁰

Conclusions

A great deal of work has been written about this joint operation of the Russian Armed Forces, and the resulting conclusions differ only through the pro's or con's of the operation. It is obvious that the Russian side has highlighted all the positive aspects of the operation, trying to blur or deny the negative or less positive effects. In the following lines, we will try to make our own conclusions seen from the perspective of an actor directly interested in the power and operating mode of the Russian Naval Forces, especially in the Black Sea zone.

As we have written in previous paragraphs, this operation is the first for the Russian Armed Forces deployed outside its historical influence zone. This shows us that it wants to regain the area of influence that was obviously lost after the collapse of the Soviet Union. The main force projection vector is the Naval Forces, which the Russian Federation has understood and commence to their obvious modernization. The main instrument by which the Kremlin has undertaken to project force in Syria is this Mediterranean Task Group, a strong naval group with a high mobility.

Finally, we can conclude: the Russian Federation's Navy has a high degree of interoperability, the Black Sea Fleet becomes a very important pawn in the naval strategy of the Russian Federation, modern weapons, especially naval missiles, have been successfully tested in a conflict and Russian Federation has preserved and even developed its outpost of "warm waters".

The Mediterranean Task Group is composed of ships from different fleets, and its command is assigned to an officer from the Black Sea Fleet. Also, the operational command of the group is under the command of the Black Sea Fleet. We can conclude that the level of interoperability among the Russian Naval Forces fleet is high, the command arrangements between them work and the Naval Forces have become modern and capable of successfully participating in joint operations.

Regarding to the Black Sea Fleet, we can express the idea that it has changed a lot, from a fleet capable of taking action in a closed sea, such as the Black Sea, into a high-deployable one and capable of conducting operations in the adjacent sea and away from its own base. This is due to the ample process of modernization and endowment that began after 2010 and accelerated after the annexation of Crimea in 2014. We also believe that the Russian Federation will continue to develop this structure because it can set up and lead naval groups capable of projecting force in the Mediterranean basin and why not through the Suez Canal in the Indian Ocean.

By participating in this conflict, the Russian Federation has had much to gain. Among the strengths we can remember is the successful testing of new military equipment, the

¹⁰ Admiral Vladimir Korolev, during the scientific and practical conference in Sevastopol, June 1, 2019, "Состав группировки, действующей в Средиземном море, может гибко меняться в зависимости от задач. Группировка обладает самодостаточностью и включает в себя корабли, оснащенные высокоточным оружием", from site <https://regnum.ru/news/2424614.html>, accessed February 25, 2019.

Buyan-M corvettes, the Admiral Grigorovich class frigates, the Varshavyanka class submarines, all equipped with the already famous Kalibr missiles. Another gain is the strengthening of the "territorial" presence in the Mediterranean basin by extending the naval base in the port of Tartus.

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CONSIDERATIONS REGARDING THE USE OF PUMA NAVAL HELICOPTER IN SEARCH AND RESCUE OPERATIONS AT SEA AND IN RIVERINE AREAS

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Abstract:

Within this scientific approach, we intend to carry out a comparative analysis of real search and rescue interventions at sea and in riverine areas and to conduct a historical parallel regarding the evolution of search and rescue capabilities of Romanian Navy helicopters.

The paper promotes the use of the Puma Naval helicopters provided by the Romanian Navy in the search and rescue missions in the Black Sea and riverine areas, as the 256 Navy Helicopter Squadron is the only national military operational structure for such missions.

Keywords: *Puma Naval helicopter; search and rescue; Black Sea, riverine areas.*

Introduction. Maritime Aviation in the Romanian Navy

The Romanian Navy plays an important role in the Romanian Armed Forces' structure, contributing to the protection of the Romanian interests in the maritime and riverine areas¹ and to the power projection and support of own forces in the military theaters of action. In order to increase the degree of interoperability between national elements of armed forces, between national and NATO forces and to increase the overall operational capacity, Romanian Navy needed to develop a naval helicopter program capable of operating at sea and riverine areas from a land base or from the flight-decks of the Type 22R frigates.

In order to accomplish those objectives, Romanian Navy resumed a Maritime Aviation tradition dating back from the beginning of the 20th century by reestablishing an air component and starting a comprehensive development process of a modern combat aircraft.

Currently, the air component of the Romanian Navy is represented by the 256 Navy Helicopter Squadron (within 56 Frigate Flotilla) established on 1st of May 2006² and it is based in Tuzla. The Documentary Note of the Army's Historical Service no. A 3471 of 15th of July 2010, the 256 Navy Helicopter Squadron is recognizing the 256 Helicopter Squadron as a

¹ Dr. Lucian Valeriu Scipanov, *Operații amfibii și riverane – o provocare națională*, Editura UNAp, București, 2018, p. 59, "the riverine areas belong to a complex environment that includes the following elements: the seaside inner area; coastal area; Danube delta; rivers and inner waterways; lagoon complexes; lakes and ponds; adjacent areas, including onshore and associated airspace.

² https://www.navy.ro/despre/organizare/istoric_elicopt.php accessed at 15.01.2019.

successor of the Hydroplane Squadron of the Sea Division, founded on 15th of May 1920³ and therefore inheriting the traditions of the last aero-maritime structure - the 256 Hydroplane Patrol - decommissioned on April 1, 1960⁴.

The air component of the Romanian Navy resumed operations on 13th of July 2007⁵, when the first of the three IAR 330 Puma Naval helicopters joined the Romanian Navy.

Puma Naval Program development

The Puma Naval Program was designed and constructed in Romania by the Romanian Navy in partnership with S.C. IAR S.A. Ghimbav, by transforming the IAR 330 Puma L Ro helicopter (capable of carrying out land-based missions) into a naval variation designed to operate from the flight-deck of the T 22R frigates and to fulfil the long-term operation requirements of the marine and riverine environment.

Following a complex modernization program, an integrated system of avionics, a weapon management complex and additional equipment needed to fulfil specific missions as an embarked helicopter, were installed onboard of the IAR 330 Puma Naval helicopter. Those additions made the aircraft capable of flying safely over the sea – day and night – and operating from shore or from the flight-decks of the T 22R.

Subsequent extensive testing procedures, both at shore and at sea – embarked on T 22R frigates – the IAR 330 Puma Naval helicopter was finally approved for operation from the frigates. During this process, the aircraft was also certified for search and rescue missions, medical evacuation, material and personnel transport and surveillance at sea.

Due to the complexity of the program, the helicopter was deployed in configuration development stages that allowed easier integration of new systems on board of the helicopter, and at the same time provided the Navy ample time to gradually adapt the new air component to specific sea missions.

The Puma Naval program was completed in December 2015, while testing and operational evaluation was performed in 2016 by the 256 Navy Helicopter Squadron within 56 Fleet Flotilla shore air-base premises and on board of the T 22R frigates.

The IAR 330 Puma Naval helicopter, in the different configurations developed during the program, can carry out a wide range of flight missions in various weather conditions, day and night, operating from a shore base or from the hangar of the T 22R frigate.

Simultaneously with the introduction of the Puma Naval Program, the Navy also began training aircrews for helicopter operations. For the first time in Romania, with the extensive support of "*Aurel Vlaicu*" Air Force Training School, the Navy succeeded training naval officers into becoming naval helicopter pilots. This was accomplished by adopting and applying models also encountered in most of the naval Air Components of western countries with vast experience in this field.

The first naval officers were certified as IAR 316 B military helicopter pilots in 2006⁶. All of them were former graduates of "*Mircea cel Batran*" Naval Academy in Constanta, specialized in Navigation, Hydrography and Naval Equipment.

Performance of the IAR 330 Puma Multirole Naval Helicopter

The IAR 330 Puma Naval helicopter inherits the experience and constructive solutions of the IAR 330 Puma SOCAT program, adapted to the marine environment and operating conditions on board of the T 22R frigates and upgraded with some of the most current systems and equipment. Starting with the construction of the helicopter body frame, the entire

³ *Idem.*

⁴ *Idem.*

⁵ *Idem.*

⁶ <http://armataromaniei.ro/armata/8/15407107461883891668449566747839> accessed at 23.01.2019.

structure of the helicopter, all the mechanical components as well as electrical and electronic devices on board have undergone a process designed to prevent the aggressive corrosion omnipresent in the marine environment.

During the development of Puma Naval Program, a series of constructive solutions have been adopted in order to give the helicopter its naval character, the ability to be housed on board of the T 22R hangars and the capacity to operate in a marine environment. Those solutions include but are not limited to: corrosion protection of the body frame and its components, folding blades, hydraulic harpoon and emergency floating devices.

The main differences between the onshore and offshore Puma helicopter's versions are related to the different construction and paraphernalia of the cell and of the mechanical parts, different avionics and instrumentation systems and the optional added equipment for search and rescue and sea survival.

The IAR 330 Puma Naval helicopter was designed to become a multirole naval helicopter. They are generally defined as organic ship sensor and weapon system, adding operational performance and diversifying the engagement capabilities. The multirole character is given by the possibility of configuring the helicopter in several equipment variants depending on the mission.

Below is a list of the main configurable systems, equipment and installations onboard the IAR 330 Puma Naval helicopter that gives its multirole character and ensures the successful execution of specific missions at sea and over the riverine areas: tactical integrated surveillance radar; electronical-optical observation system; launching hydro-acoustic buoys; antisubmarine console and tactical console; integrated *Automatic Vessel Identification System* – AIS; lightweight torpedoes/expandable fuel tanks; *High Frequency* – HF, *Very High Frequency* – VHF, *Ultra High Frequency* – UHF, data link communications; radar and laser warning system; chaff and flare countermeasures launching system; Emergency beacon detection system and *Direction Finder* – DF; external cargo transportation installation, troop transport and wound transport installation; machine gun installation by each side door; systems for the insertion and extraction of special forces; electric rescue hoist and search light.

The IAR 330 Puma Naval Helicopter is an integrated naval system due to two main reasons. Firstly, because it can be embarked on board of the T 22R frigates where there are the necessary conditions for mission planning and preparation, helicopter and flight crew training, flight management and guidance, take-off and landing platform and also flight and combat capability replenishment. Secondly, the helicopter is capable of executing missions in support of the T 22R frigates under the demanding conditions of an often hostile environment. This integration blends the requirements of operational and environment effectiveness with the development of skills and techniques, interfacing and perfecting specific organizations in order to fuse aeronautical and naval domains in one effective ship-airship entity.

The missions of naval helicopters

As stated in the National Security Strategy of Romania, "Navy conducts military actions, independently or within multinational groups in order to ensure the integrity of maritime and riverine space, participates in the enforcement of national and international legislation in territorial waters, contiguous area and economic exclusive zone, conducts maritime security operations and the search and rescue at sea and inner waterways"⁷. In accordance with the National Security Strategy of Romania, helicopters in the Navy are intended to carry out specific operations/missions, independently or in cooperation with other operational structures, in support of ships, naval infantry units or Special Forces, other national or allied military entities, both from land-based and ship-borne facilities, in their area of responsibility.

⁷ Strategia Militară a României, cap. V, aln. (9), 2016.

The main advantages of using the naval helicopters in maritime and riverine operations⁸ are: an extended surveillance area and supplementary information influx due to increased flight height, augmented tactical range and additional means of search/detection against surface naval targets provided via data transmission channels.

The Naval Helicopter is a system of sensors designed to increase operational capacity at sea and in the riverine areas, taking off from land or ships and carry out a wide range of missions. Depending on the type, technical characteristics, hydro-meteorological conditions and concepts of combat use, IAR 330 Puma Naval helicopters can execute the following peace, crisis or war missions⁹:

a) combat support for the own ship or for other naval forces – by means of detection, classification, identification, tracking and attack of submarine targets (*Anti-Submarine Warfare – ASW*); search/surveillance of objectives, sea lines of communication routes, maritime areas (*Intelligence Surveillance and Reconnaissance – ISR*); search, detection, tracking, classification and identification of surface targets (*Anti Surface Warfare – ASuW*); enforcing/supporting maritime interdiction operations (*Visit, Board, Search and Seizure – VBSS*);

b) logistic support for own ship and other forces deployed at sea - by means of passenger, weapons, military equipment, ammunition, other materials transfer, *Medical Evacuation – MEDEVAC*, sick/injured transport (*Casualty Evacuation - CASEVAC*), *Vertical Replenishment at Sea – VERTREP*;

c) Maritime troop transport – insertion/extraction of combat teams during special operations, launch/recovery of combat divers, landing/recovery of special forces teams on the seaside or deep in the enemy controlled territory, including anti-terrorism and anti-piracy;

d) *Search and Rescue – SAR and Combat Search and Rescue – CSAR*.

Helicopter in SAR at sea and in the riverine area

Below are presented some theoretical aspects related to the search and rescue actions during peace time, crisis or war (CSAR).

Search and rescue during peacetime (SAR) is defined as an action based on the use of specialized aircraft, ships and submarines, rescue teams and equipment by which personnel in distress on land or at sea is searched.

In line with the International Civil Aviation Organization (ICAO) regulations and the International Maritime Organization (IMO), SAR is a national responsibility that can often be delegated to the armed forces in operations performed in peace time.

Military analysts believe that search and rescue missions in peace time (SAR) are radically different from missions conducted in enemy controlled areas, so CSAR are actions that is being executed during crisis situations or war times.

The main function of SAR/CSAR operations is to save lives, not only to rescue military personnel, SAR/CSAR support is also provided to civilian and naval vessels in distress, in the event of maritime and civil aviation disasters.

The current helicopter was transformed by technology over years into one of the most effective search and rescue tool at sea. The current level of technological progress in the aeronautical domain, particularly the experience gained over 60 years in the design and construction of helicopters provides improved avionics, significant range increase, new

⁸ Dr. Lucian Valeriu Scipanov, *Operații amfibii și riverane – o provocare națională*, Editura UNAp, București, 2018, p. 60, "Riverine operation is a military action conducted in a complex geographic area, predominantly amphibious, by forces specifically designed".

⁹ Misiunile elicopterului IAR 330 Puma NAVAL conform http://www.navy.ro/despre/organizare/misiuni_el.php, <http://www.aspecte-diplomatice.eu/stiinta/1019-elicopterul-iar-330-puma-naval-intre-primele-10-elicoptere-din-lume-destinate-luptei-antisubmarin>, <http://www.romania-actualitati.ro/al-treilea-elicopter-iar-330-puma-naval-livrat-mapn-84439>, accessed at 23.01.2019.

aerodynamic coefficients, better turbines to propel the helicopters, augments transport capacity, improves search-detection ranges and delivers modern means of rescue, all coupled with state of the art communication equipment.

Globally, the helicopter supremacy in search and rescue missions at sea and inland is indisputable, demonstrating their superiority to planes ever since the Second World War. Experts in the field have consistently analyzed and improved the performance of helicopters in search and rescue missions at sea in support of seafarers on civilian and military ships in distress, catapulted pilots and other shipwrecked or endangered persons.

Following this trend, one of the main peacetime missions of the Puma Naval helicopter is to conduct search and rescue of personnel, ships and aircrafts in distress at sea and inland waterways (SAR). Since its operationalization, the 256 Navy Helicopter Squadron has successfully participated in a series of search and rescue operations, consequently resuming the tradition of Puma H and Puma L helicopters in such missions.

Being designed to serve the Navy, acting mainly in a marine and riverine environment, the IAR 330 Puma Naval helicopters were equipped with state-of-the-art equipment to cover a broad range of offshore missions. Below, is a brief description of the main systems and equipment that represent the strengths of the Puma Naval helicopter in Search and Rescue missions at sea and in the riverine areas and which determines the element of uniqueness of the Puma Naval helicopter, being the only aircraft in the country with full capabilities to conduct search and rescue missions at sea and inland.

To monitor the emergency frequencies and to accurately locate the transmitter (radio beacon), the helicopter is equipped with the *Direction Finder System* – DF. Currently the IAR 330 Puma Naval is the only helicopter in Romania that has the ability to locate emergency beacons of ships/aircraft in distress or people at risk at sea and inland waterways. Among other features, the possibility of simultaneously monitoring two subgames and monitoring multiple COSPAS – SARSAT beacons with a precision of up to 5° is instrumental in SAR operations at sea.

As optional equipment, the rescue electric hoist is also an excellent capability. It is intended to deploy rescuers, recover shipwrecks and allows for personnel and material transfer. It is one of the latest generations of helicopter electrical hoists, with superior technical characteristics compared to other aircrafts that operate on national territory.

Another unique capability nationwide is the *Night Vision Goggles* – NVG compatible search light, with a range of 500 m, trainable in two axes, having the possibility of adjusting the angle of the beam between 2°-15°, and it can play a determining role in the search and rescue missions at sea and riverine areas conducted during night.

In general, the key factor in achieving the success of a Search and Rescue mission at sea and riverine areas is the human factor, the crew of the aircraft performing the mission. This aspect was approached with the utmost care and professionalism by the 256 Navy Helicopter Squadron Staff. Specialized theoretical training, training and qualification of pilots for heavy weather, night and NVG conditions took place in parallel with training of onboard engineers and rescue swimmers.

In order to prevent disasters and as a lesson learned from history, it was decided to prepare a rescue swimmer team at the Diving Center of the Navy. The team completed a helicopter search, rescue and recovery course. Extremely demanding and rigorous, the course was attended by petty officers who went through all stages of a rescue operation: diving and deep sea diving, helicopter free jumps, helicopter recovery on land and water, with all available means of rescue: rescue harness, rescue basket, stretcher.

The course conducted with the Diving Center was also a first of many other firsts in the ambitious Puma Naval Program and was just the startup point of the applicant's training and rescue training process to be able to intervene in heavy weather and save people injured or in distress at sea or the riverine areas.

All those efforts put in by the Navy to develop SAR capabilities within the 256 Navy Helicopter Squadron have been tested in real life and proved to be appropriate, saving sailors' lives and avoiding the loss of human life at sea.

SAR conducted in the Black Sea

In pursuit of this scientific approach, a comparative analysis of real search and rescue interventions at sea and riverine area is presented below, along with a historical parallel to the evolution of SAR capabilities at sea and inland waterways of the Romanian Navy.

The first part of this subchapter presents a series of search and rescue missions performed by the 59th Air Force Helicopter Regiment, responsible for the Dobrogea area.

- MV Maty (Albanian flag) with 17 crew members under severe meteorological conditions - very high waves, winds of 10-12 m/s, lost governance, drifted and at the entrance to Constanta Port was pushed by the current and crushed against the external breakwater 200 meters south of the entrance. Following a request for distress, the Puma helicopter executed a SAR mission at sunrise using a rescue chair lowered onto the ship and each crew member boarded himself to be safely taken to shore¹⁰.

- Cargo MV Akra Aktion failed on February 19, 1981 under a heavy storm and crippled by technical issues, across Vama Veche¹¹. 21 sailors were rescued in a second helicopter intervention, after the first responding helicopter failed to approach. The second crew, more experienced, acted in strong wind conditions and extracted all crew members, with the help of a rescue chair, in two interventions.

- MV Sadu¹², collided with the northern breakwater of Constanta Harbor on December 2, 1988, in adverse weather conditions with strong winds, high waves and fog, following a grabbing of the anchor. Without the necessary rescue equipment, an IAR 330 Puma helicopter attempted to save the crew members gathered on the standard deck but due to the lack of adequate rescue means, only a document transfer from the ship to the helicopter was performed.

A number of factors were identified in all the above incidents: most hazards occur under heavy weather, storm, strong wind, high waves, low visibility; helicopters are required to intervene at night; lack of adequate means of rescue; helicopter crews not trained and the lack of rescue swimmers trained for such critical situations.

In meteorological conditions where helicopters can carry out rescue missions while respecting constructive constraints and limitations on wind and rainfall, crew flight experience, time of action, training in such missions, endowment the helicopter with modern means of rescuing and the existence of rescuers among the aircrew members make the difference between life and death.

The last part of this subchapter will briefly detail two recent SAR actions at sea and inland waterways conducted by helicopters of the 256 Helicopter Squadron.

The search latter assistance provided for a captive ship on the frozen Danube, between Călărași and Fetești. The IAR 330 Puma Naval helicopter had the technical possibility to establish radio contact and to locate without difficulty the position of the ship in distress by means of high-performance communications stations and especially by using the DF. With the help of the performant electrical hoist and the rescue swimmer, humanitarian assistance has been given by landing emergency rations and survival equipment onboard the vessel, increasing the crew's autonomy until the river defrosted.

The last search and rescue intervention analyzed is the most complex. During a strong Black Sea storm on the night of 7 to 8 October 2014, the cargo ship "Fortuna S" failed at the

¹⁰ Dumitru Cristian, *Amintiri amintiri amintiri: Aviația, fascinație și risc*, Next Book, 2015, p. 146.

¹¹ *Ibidem*, p. 170.

¹² <https://www.ziuaconstanta.ro/stiri/social/25-de-ani-de-la-naufragiul-cargoului-sadu-in-aceasta-tragedie-au-pierit-15-navigatori-478246.html> accessed at 25.01.2019.

entrance to the Danube Sulina navigable channel, lives of the 12 crew members being in danger. The SAR mission was assigned to the 256 Navy Helicopter Squadron Helicopter who successfully and safely evacuated the crew from the ship using the IAR 330 Puma Naval helicopter and specialized rescue personnel trained purposely for such missions.

The SAR action was conducted in heavy weather conditions, low visibility, and very strong winds, and applied all the lessons learned by the 256 Navy Helicopter Squadron so far. The intervention implied a number of particularities that the crew adapted in real time:

- alerting staff, preparing the helicopter for the flight and the mission in the shortest time, starting with 00:30;

- the helicopter crew was comprised of pilots with a lot of flight experience;

- for the rapid and safe evacuation of the ship's crew were used two rescuers, one descended on the failed ship and one remained in the helicopter for fast handling of the rescue basket.

- Although NVG equipment allowed extraction of crew members at night, very strong winds and antennas on the superstructure of the ship prevented the safe lowering down on the ship. For the safety of the rescuer, the intervention was performed after the sunrise reducing the risk of hitting the ship's antennae in the strong wind;

- the distance from Tuzla to Sulina has increased the helicopter flight time. In order to maintain availability in situ while waiting required a search for an adequate safe landing near the ship.

The analysis of the last two search and rescue actions reveals a number of similarities in the adverse weather conditions, but the success was ensured by the superior equipment of the Puma Naval helicopter, the existence of rescue swimmers and the crew the courage, flight experience, professionalism, and the ability to analyze and make split second decisions, all traits achieved throughout the construction/training process of the modern IAR 330 Puma Naval project for the Romanian Navy.

Conclusions

The tradition of the early 20th century Air Component in the Romanian Navy was resumed, after 55 years, by the establishment of the 256 Navy Helicopter Squadron of the 56th Frigate Flotilla, having three IAR 330 Puma Naval helicopters.

One of the main missions of the Puma Naval helicopter is to search for and rescue personnel of ships/aircraft in distress from land, sea and riverine areas, both in peacetime (SAR) and crisis situations or war (CSAR).

Modern helicopters have proven their excellence in search and rescue actions through: the use of an expanded field of visual and radio-electronic search obtained at flight height; increased monitoring abilities for emergency frequencies and direction finding from which the distress message is received; the ability to recover on board several persons (even injured) in danger, with the help of the rescue swimmer and other modern means of rescue, without having to land and; by the speed of transit and the ability to intervene exactly at the site of the distress due to the constructive aeronautical qualities.

Benefiting from all the advantages of modern helicopters, the IAR 330 Puma Naval is equipped with updated systems and equipment specific to sea and riverine SAR missions, being the only aircraft in the country with full capabilities to conduct SAR missions at sea and inland. Moreover, it may have extended seagoing autonomy following the embarking and combined action of the ship-helicopter entity in SAR or CSAR.

In order to achieve a high SAR capability and to avoid other catastrophes in the Black Sea, the solution for training rescue swimmers in the Diving Center of the Navy was implemented through a Helicopter Search and Rescue and Recovery Course, this being another premiere adjacent to the Puma Naval Program.

Since the 256 Navy Helicopter Squadron has been operationalized, the IAR 330 Puma Naval helicopters have successfully conducted SAR missions at sea and in riverine areas, avoiding the loss of human life at sea.

In meteorological conditions where helicopters can perform rescue missions respecting constructive constraints and limitations to wind and precipitation, the flight crew's experience is particularly important, as well as the training in such missions, equipping the helicopter with modern means of rescue and the existence of rescuer swimmers in the air crew.

The IAR 330 Puma Naval helicopter and the possibility of embarking on board the T 22R frigates, with trained pilots and rescue swimmers coupled with specific over the sea flight training makes the 256 Navy Helicopter Squadron the only capable operational structure at national level for search and rescue missions at sea and in riverine areas and also a regional SAR capability of the Romanian Navy.

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NATO'S CURRENT APPROACHES TO CYBER DEFENCE

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Abstract:

Cyberspace, manifested by its rise in recent years has become an important vector in the international arena, drawing the attention of the world powers. Attacks on several NATO member states, as well as the rapid development of attack techniques by several state actors, made the alliance adopt a categorical position in this regard. Moreover, cyberspace was treated as an operational environment and cyber defence as a direct defence of action. Thus, certain NATO concepts related to cyber defence will be presented in this article.

Keywords: *cyber space; cyber defence; Tallin Manual; NATO.*

Chronology of Defining Events for the Development of Cyberspace Operational Environment

The concept of cyber defense within NATO has developed proportionally with emerging threats in cyberspace, as well as targeted attacks on several military infrastructure elements of the alliance. Once they had increased in number and intensity, causing significant damage, the idea was born of accrediting cyberspace as an operational environment. This transformation has occurred gradually, starting in 2002, in the context of the NATO Summit in Prague, being resumed in 2006 in Riga. Thus, the North Atlantic Alliance has included the subject of cyber defense on the agenda of the meetings to most of the summits.

At the summit in Bucharest in April 2008, the first version of the cyber defense policy was approved, focusing on strengthening information systems by the organization and the allied nations against possible cyber-attacks. In this respect, there were highlighted the need for exchanges of experience between the partners and their support on rejection of possible attacks. Two years later, in Lisbon (2010), there had already been felt the need to update this policy in depth and impregnate the task to be carried out by the year 2011. There were also discussions about the capacity of detection, evaluation, prevention, defense and recovery in case of a cyber-attack against critical infrastructure organizations.

In 2012, in Chicago, along with the topics taken from previous statements, the debates were focused on completing reforms bringing all NATO bodies under centralized cyber protection based on NATO Computer Network Incident Response System and services expertise provided by the Cooperative Cyber Defence Centre of Excellence in Estonia.

The Declaration of the Wales Summit (2014) was marked by the endorsement of the "*Enhanced Cyber Defense Policy*" document, which aims to develop the organization's policies by year 2014 and collective defense by invoking Article 5 of The Washington Treaty (1949) on the NATO alliance's mutual defense guarantee.

The implementation of this policy was further supported at the Warsaw Summit in 2016. At this summit it was the first time to have had discussions about "fighting the cyber war", the importance of cyberspace and its defensive actions treated the same as the armed actions. More specifically, Chapter 70 of the Warsaw Declaration states that „*we reaffirm NATO's defensive*

*mandate, and recognize cyberspace as a domain of operations in which NATO must defend itself as effectively as it does in the air, on land, and at sea. This will improve NATO's ability to protect and conduct operations across these domains and maintain our freedom of action and decision, in all circumstances. It will support NATO's broader deterrence and defence: cyber defence will continue to be integrated into operational planning and Alliance operations and missions, and we will work together to contribute to their success*¹. This Summit therefore recognizes cyberspace as an operational environment, which has changed the content of Member States' national security strategy and military doctrine.

At the Brussels Summit in 2018, Allied leaders agreed to set up a new Cyberspace Operations Centre (COC) as part of NATO's strengthened Command Structure. The Centre will provide situational awareness and coordination of NATO operational activity within cyberspace. Allies also agreed that NATO can draw on national cyber capabilities for its missions and operations. Finally, Allies took stock of their progress to enhance national resilience through the Cyber Defence Pledge.²

It is possible to identify a vast improvement of NATO's defense measures from one summit to another as a response to cyber-attacks and the emergence of many new elements specific to cybersecurity. The complexity and diversity of attacks have made the subject of cyber defence become indispensable on the agenda of summits and member countries should align with the policies and strategies implemented in the field of cyber defence.

Cyber Defence Strategies

The cyber security strategy of the organization was concretized through the *Cyber Defense Concept* of 2008 and *Cyber Defense Policies* in 2007, both of them having restricted access to the public and interpretations and analyses about them were made only from international media reports. One of the objectives of NATO's cyber defense policy is to ensure interoperability and the legal framework for cooperation with member countries in case they are targeted by cyber-attacks.

Rather than dismiss acts of state-sponsored hacktivism as nothing more than conventional acts of crime or espionage, NATO needed it a more robust account of how such behavior may be interpreted and encompassed within the jurisdiction of existing law.³

On the same note, representative for NATO remains the Tallinn Manual, an advisory document with a second version issued in February 2017, prepared by the international group of experts at the invitation of CCDCOE (the NATO Cooperative Cyber Defence Centre of Excellence), in Tallinn, the capital of Estonia. The group of experts identified in the Tallinn Manual 2.0 154 general rules to be followed, based on the international law applicable to cyber security. The manual is divided into four parts. The first part refers to international law and cyberspace. The second part is dedicated to specialised regimes of international law and cyberspace. The third part covers topics related to international peace and cyber-security activities, and the last part refers to the application of the law of armed conflict in cyberspace.

Rules 20 and 21⁴ are interesting because they mention that a state has the right to respond (through cyber actions or not) to a cyber-attack as a form of response to non-compliance of another state with a provision of international law, provided that it is able to show that the State to comply with its legal.

¹ Warsaw Summit 2016 Declaration, https://www.nato.int/cps/en/natohq/official_texts_133169.htm, found on 12.01.2019.

² https://www.nato.int/cps/en/natohq/topics_78170.htm, found on 12.01.2019.

³ George LUCAS, *Ethics and cyberwarfare: the quest for responsible security in the age of digital warfare*, Oxford University Press, New York, 2017, p. 64.

⁴ The Tallinn Manual, *On the International Law Applicable to Cyber Operations*, 2nd edition, Cambridge University Press, 2017, pp. 111-122.

Although it is an advisory document, the Tallinn 2.0 Manual is a landmark document for cyber defense specialists, probably until another version appears in the future. The manual became a benchmark by analyzing international law issues related to cyber operations.

NATO Entities involved in Cyber Defence

NATO entities are heading towards a common cyber defence, fact accredited by the statements of the latest NATO Summits. Within the organization, cyber defense policy is put into practice by political, military and technical institutions, as well as by each member of the organization, in an individual manner.

Figure 1 shows the main institutions of the alliance with a defining role in ensuring cyber defence. The complexity of NATO's approach to cyber defense has led to a series of actions involving all Member States.

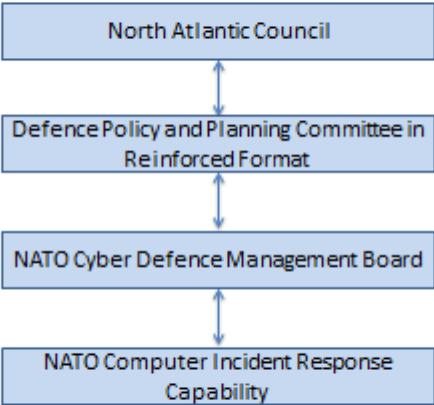


Figure no. 1 - NATO Cyberspace Governance – Schematic Institutional Chain Diagram⁵

The North Atlantic Council–NAC is intended to provide high-level political supervision of all the details of implementing the Alliance’s plans. Information on major cyber events arrives at the Council, thus exercising its authority to manage cybernetic crises in the field of defense. The Cyber Defence Committee⁶ – CDC is the NAC’s main body of policy on cyber defense, with a consultative role, mainly on supervisory and expert level advice for the allied countries, and it carries out common cyber defense governance within the alliance.

On the execution level, the Cyber Defence Management Board–CDMB is the main cyber defense coordinator, this responsibility being met with the help of NATO’s military and civilian organizations. The CDMB is made up of NATO’s political and military leaders, technical and operational bodies with cyber defense responsibilities. Its activity involves preparing strategic planning and implementation directions for the alliance’s cyber infrastructures, and signing memoranda with Member States for information exchange.

Also, the main actors involved in the security of cyber infrastructures and with responsibilities in the field are the Allied Command Operations-ACO, the Allied Command Transformation-ACT and the agencies of the alliance.

NATO Communications and Information Agency – NCIA is responsible for the entire management process for cybersecurity activities. This implies, among other things, identifying the state of the operational requirements, procurements, testing, implementation and operation of NATO’s cyber defense capabilities. The agency was set up on July 1, 2012 as a result of the Lisbon Summit Declaration, and formed by the merger of seven NATO agencies, with the role of providing services specific to Communication and Information Systems and cyber activities.

⁵ <http://securityaffairs.co/wordpress/20705/cyber-warfare-2/nato-attack-response-teams.html>, found on 10.01.2019.
⁶ <https://ccdcoe.org/nato.html>, found on 14.02.2019.

At the same time, the NATO Computer Incident Response Capability – NCIRC has a decisive role in responding to aggressions against the alliance, coming from the cyber space, and it carries out activities specific to counteracting and limiting cyber incidents. This entity, in turn, issues and sends information in order to prevent and mitigate effects on cyber infrastructures, infrastructure owners, security administrators, operators and users. NCIRC's ability is to protect cyber infrastructures by providing centralized services and permanent support for cyber defense for NATO sites. The purpose of the structure is to have control over incidents through efficient management, to send reports and information about incidents to users, and implicitly to use rapid response teams in order to protect the alliance's cyber infrastructure.

NCIRC is NATO's main source of technical and operational expertise and capabilities in cyber defence. It works to protect NATO entities and missions and to help NATO members address cybersecurity threats to their information technology systems. The diversity of these tasks creates different challenges for NCIRC.

On 8 November 2017, defence ministers expressed their agreement in principle on the creation of a new Cyberspace Operations Centre (CyOC) as part of the outline design for the adapted NATO Command Structure. This will strengthen NATO's cyber defences, and help integrate cyber into NATO planning and operations at all levels. Ministers also agreed to allow the integration of Allies' national cyber contributions into Alliance operations and missions. Allies will maintain full ownership of those contributions, just as Allies own the tanks, ships and aircraft in NATO missions. On 5 December 2017, NATO and EU Ministers agreed to step up cooperation between the two organizations in a number of areas, including cyber security and defence. Analysis of cyber threats and collaboration between incident response teams is one area of further cooperation; another is the exchange of good practices concerning the cyber aspects and implications of crisis management. Following the announcement of 8 November 2017, defence ministers agreed on 14 February 2018 to set up the proposed Cyberspace Operations Centre in Belgium.⁷

The new NATO military Cyber Operations Centre in Belgium (Mons) should be fully operative up to 2023. The new structure will be responsible of the cyber defense and cyber-attacks against terrorism. Once ready, it will coordinate the Alliance's cyber deterrent through a 70 team of experts, fed with military intelligence and real-time information about hackers.⁸

As the NAC provides strategic and policy guidance, and NATO Headquarters committees provide governance, ACO provides the planning, organization and execution of all NATO operations. ACO operates at all levels (strategic, operational, and tactical) to achieve it's the main mission of ensuring integrity of Alliance territory as well as supporting missions that may require deployment outside the area of responsibility.

Conclusion

The political-military alliance profile of the North Atlantic Organization requires increased attention to the international politics on the world stage. At the summits, NATO has always provided prompt responses to cyber threats and cyber-attacks. The impact of cyberspace events has caused serious prejudice to national security and safety of several states. Once more states, with the status of great powers of the world, are suspected and accused by the alliance of launching more cyber-attacks, which has led the alliance to gradually resort to a series of resolutions, resulting in the assimilation of cyber into the operational environment, along with the other traditional warfare domain of: land, sea, air and space.

⁷ https://www.nato.int/cps/en/natohq/topics_78170.htm, found on 12.01.2019.

⁸ <https://www.difesaesicurezza.com/en/defence-and-security/nato-the-new-cyber-operations-centre-cyoc-should-be-fully-operative-in-2023>, found on 16.02.2019.

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THE INFLUENCE OF PSYCHOPHYSICAL TRAINING ON FACTORS (FUNCTIONS) WHICH MULTIPLY/DIMINISH THE COMBAT POWER

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Abstract:

The article addresses the factors that multiply/diminish the level of potential combat power of tactical military structures in land forces on the two dimensions: action (combat functions) and natural (environmental factors). Regarding the combat functions, it is observed that, in the process of the military training, psychophysical training occupies an essential place in the acknowledgement of skills, attitudes and values that amplify the fighting power and build a strong character for the fighter, such as: effort capacity, robustness, psychophysical resistance, energy-volitive potential, motivation, cohesion, trust, loyalty, altruism, integrity, solidarity, spirit of discipline, self-mastery. Also, the decrease of the psychophysical effort capacity caused by the operational environment factors can not be eliminated, but their effects can be definitely reduced by pursuing training programs focused on training the skills necessary for action as close as possible to the realities of the modern battlefield.

Keywords: *combat power; psychophysical training; combat functions; environmental factors; physical education and sport.*

The modern battlefield is characterized as being of immense complexity with a very wide range of combat and environmental factors that, in a given situation, can influence more or less, sometimes even de facto, the battle. It is obvious that, in a real situation, not all factors can be taken into account, regardless of the level of technological development they have reached, but they can be appreciated by the commander and whether or not you consider it.

The paper addresses those factors that, following an effective psychophysical training activity, can influence the battle and can determine the level of potential combat power of the tactical structures, which are in the field of action (fighting functions) and natural (environmental factors).

A. Combat functions are: battle command, intelligence superiority, fighters' morale, fire power, maneuver, protection, vulnerability, surprise. Of these, we will briefly describe those which can multiply the level of combat power of a tactical structure.

The command of the battle involves the commander's responsibility for the military structure to be efficient. This is more than a direct leadership style and is based on leadership qualities. Efficient command is essential for units in order to be managed and deployed successfully. Leadership at all hierarchically levels is an extremely important element that influences the quality of the armed forces. Developing the skills of military leaders (commanders) is based on an intensive process that should include both institutional methods (training programs) and individual study.

"Commanding as a function of leadership involves both the existence of a persuading authority and the training of staff and the understanding of psychosocial determinations of human behavior in the organizational environment."¹ In fact, command means the authority given to a military individual to lead, coordinate and control a military structure. Combat command is the art of stimulating the military to achieve the goals of any military operation, to self-motivation and motivate others. Moreover, leadership means the art of maximizing the support and effort of the military structure, of finding pertinent solutions to solving the increasingly different situations that may arise in the modern battlefield.

Of all the types of authority identified, the charismatic one has always inspired the interest of the researchers, the skilled military leaders being characterized by it. Thus, accepting that physical education is a way of life, participation in sporting and applied-military competitions, adjacent to vocation, grace, the mission for which they were appointed, lead the military commanders towards the completion of an exceptional character. The measure of authority is the performance itself, in the field of military physical education and sport, which in the case of the charismatic leader means the concrete result/proof that is validated it in the eyes of the subordinates. Only exceptional results, proven in various situations, are the most convincing arguments.

It was found that battle demands have a strong negative effect on military behavior, which ultimately reflects in the behavior of the whole collective and under certain conditions in the process of leadership. Military specialists emphasize that the commanding process is also influenced by the diminishing effort capacity of commanders, who are also subject to demands. So, the commander must be physically robust enough to overcome his own weaknesses and use his full combat capability. Maintaining and raising the level of the moral-psychological state of troops as well as physical resistance depend on a large extent of the personal example of the commanders.

The morale of the fighters has always been one of the most important factors in fighting and getting the victory. The morale of the army is an important factor determined by the strength and cohesion of the army, the deployment and outcome of the war. Morale is a temporary emotional state that reflects the attitude and level of the individual's or group's energoaction commitment to current missions and, in particular, to the future ones². From an action point of view (the effectiveness of military action), morale is the instrument that informs us of the individual's or group's potentially energetic to achieve a goal, their favorable/unfavorable attitudes towards performing a particular mission. The moral expressing predispositions/provisions for people's action, defined along with the level of preparation for combat and the level of weapons and combat equipment, the combative ability of any military structure.

The success of any combat mission is largely due to the factor we should never ignore – **the morale**. *Take the best man and destroy his morale, it's like leaving a legged athlete*. The morale makes you keep going on regardless of the obstacles, it is responsible for raising yourself even though you have fallen so many times, it gives you confidence when others do not, it gives you motivation and ambition and makes you "the best". Knowing the systematically studying of evolution of moral status at individual and group level is required by at least two considerations, namely: the achievement of the goal of raising the combat capability of the subordinates; possession of information and conclusions necessary for the qualitative exercise of the management act.

¹ I. Bălăceanu, D. Dumitru, I. Ioana, *Potențialul de luptă al forțelor terestre în context NATO*, Editura Top Form, București, 2006, p. 158.

² *Lexiconul militar*, Editura Militară, București, 1980, p. 452.

The analysis of the mode of morale manifestation reveals that exists in the form of two main types, in a permanent interconditioning: individual morale and collective morale. As far as the individual morale is concerned we must distinguish between the commander's morale and the morale of the fighter. While a fighter's morale influences or not the behavior of the other fighters, the commander's morale decisively influences the behavior of the subordinates. Collective morale is a resultant moral of all the soldiers constituting that group, being generated by psycho-individual and psycho-social factors.³

Based on the analysis of the individual's and the group's conduct, the moral structure allows to anticipate the subsequent evolution of their behavioral facts and manifestations, so that any military or group of soldiers is evaluated. The structure of the moral comprises an attitude component, which is a main component, which has a relative stability and represents an intercorrelated ensemble of mental and psychosocial products and an emotional component, composed of states and changing psychic experiences.

Military morale is determined by a multitude of factors. Of the most important factors that determine the level of military morale, we chose to detail the following:

- **physical factors** – training and living conditions (accommodation, feeding, equipment, rest, post-exercise recovery, medical assistance, material and monetary legal rights, material and training base); conditions and means of information, culture and military education, entertainment and sports; instructional conditions (type and intensity of training, weapon performance, weather and terrain); level of physical development of the individual (strength, speed, coordination skills);

- **psychoindividual factors** – the level of specialized training; age; marital status; personality traits (courage, boldness, loyalty, altruism, integrity, solidarity, spirit of discipline, self-control, etc.), interest, conviction, ideals, religious beliefs, motivation and personal satisfaction, resistance, psychological and behavioral stability under particular conditions (increased risk, dangers, sleep deprivation, prolonged effort, stress, etc.);

- **psychosocial factors** – leadership style of commanders; social status; cohesion and the psychosocial climate of the group; the attitude-value consensus; interpersonal relationships; authority and prestige; communication relations; collective opinion; confidence in the collective, subunit, commanders (chiefs), in weapons; group performance; attachment to the military institution; state and disciplinary practice; the system of rewards and punishments⁴.

Regular practice of military physical education, sport in an institutionalized environment, builds a strong character. But this can not be done by chance, but it is necessary to have a clear intention, a precise direction to follow. Commanders at all echelons and responsible for Physical Education and Sports (officers/non-commissioned officers, teachers, coaches, instructors), through their actions, should bring to light the values of sports, translated perfectly into everyday life, as well as in military life. These values refer to respect for oneself and others, meaning honest correctness and attitude at the time of defeat, as well as humility in victory and the virtue of abnegation.

The warrior needs to build a strong character but at the same time a good character. A man of good character possesses virtue, which implies an ability to act in a certain way. But virtue is not a quality characterized only by action, but a feature of the intellectual and emotional sides. So a person who has a good character, a virtuous man, acts for good reasons and powerful passions. Psychophysical training is one in which such moral development takes place. It is known that constantly practicing physical education and sports develops individuals with multiple personality traits (courage, boldness, loyalty, altruism, integrity, solidarity, discipline, self-control) and also the practitioners of this activity manifest

³ I. Bălăceanu, D. Dumitru, I. Ioana, *op.cit.*, p. 159.

⁴ *Ibidem*, pp. 160-161.

generosity, fairness, respect for rules and cooperation, virtues indispensable for a high moral, which must be endowed with every fighter.

The fire power as a function of the battle consists in the efficiency of the fire and in the possibilities of executing the fire maneuver. The efficiency of the fire is achieved through the judicious selection of the fire execution process, the choice of the opening time and the type of the fire, the increase of the accuracy, the speed of execution, the concentration and the execution of the fire, its judicious leadership in any circumstances. The quantifiable factors that influence the power of fire are: target effect, probability of target striking, fire maneuverability, rapid fire opening and sustained firing rate and weapon invulnerability.⁵

Fire power parameters can be grouped into the following categories: ammunition parameters; armament-ammunition system parameters; the parameters imposed by the armament-ammunition-turret system; product set parameters; parameters related to the target effect.

So, as we can see, the power of fire depends on a number of factors, variables, parameters, all of which are characterized by speed, agility and sustained rhythm. In addition, increasing muscle strength, *eye-to-hand* and *eye-to-eye* coordination, aimed rapidly action using weaponry and equipment, can only be achieved through a rigorous physical training program with specialized instruction.

Maneuvering is a complex element of the battle that is highlighted by: preparing and executing it in a unitary conception, rapidity in execution, opportunity to trigger and execute it secretly. It is also a complex of actions whereby an optimized group of forces and means, in the place set and at the right moment, as well as a position in an advantageous situation against the opponent in order to execute decisive blows on the enemy, the destruction of forces, the rejection of acts or the removal from its blows. A successful maneuver means the use by commanders of various methods of regrouping, moving and acting to surprise the opponent, mislead him, use the advantages of the field, and use as forcefully as possible the forces and means.

It is well-known that one of the main dynamic elements of the combat power at a tactical level military structure is its availability to move rapidly in any terrain and weather conditions and to take maneuvering action in the complex conditions of the operational environment. In other words, maneuver is the movement of one's own forces to ensure and maintain an advantageous position, the means by which force focuses on the critical point to gain surprise, psychic shock, physical and moral moment.

The main features of the maneuver are: simplicity, amplitude, continuity, efficiency, mobility, the ability to cope in any direction. Simplicity is the assimilation of the maneuver to be easy to carry out, ensuring both through conception and execution. Amplitude represents the space in which the maneuver is designed and executed, as well as the amount of forces and means subject to it. Space has grown at the same time as the development of warfare. The continuity of the maneuver is a feature that calls for the absence of breaks that the enemy could exploit. The efficiency of the maneuver is its quality to produce the greatest possible effect. Enhanced mobility of the troops allows the grouping to perform: advancing the opponent in action, wide and deep maneuvers, rapid change of effort direction, avoiding surprise, winning and maintaining the initiative, etc. The ability to cope in any direction is, in fact, limited to the ability of the device elements to act in any direction, surprising the enemy.

Essential requirements for an efficient maneuver and, implicitly, for the success of operations are initiative and agility. The initiative is *"a reflection of the armed battle law requiring offensive actions to achieve final victory in the war, and it takes into account*

⁵ Ing. Gabriel Şiţu, Ing. Marin Gâlceavă, Ing. Elena Raicea, *Artilerie autopropulsată*, apud V. Buţa, G. Alexandrescu, D. Dumitru, *Elemente dinamice ale câmpului de luptă modern – puterea de luptă*, Editura Universităţii Naţionale de Apărare, Bucureşti, 2004, p. 37.

*constantly aggressive attitudes and actions by hitting the enemy by any means at its disposal. It must be judiciously combined with **actions to maintain effort capacity** by restoring/regenerating force and preventing non-combat attitudes in unfavorable situations".⁶ Agility "is expressed by the ability of its own forces to act faster than the enemy, being both **physical and mental quality**, but also a condition for taking over and maintaining the initiative"⁷.*

As we can see, the main characteristics of the maneuver are definitely influenced by the ability to move and cross the various obstacles in the battlefield, the speed of execution of specific actions, initiative, mobility, flexibility, effort (physical or psychic), continuity (resistance), all of which are achievable only a thorough effective training process, amid the physical, psychological and special training of the entire tactical level structure in the land forces.

The protection analyzed through the functions of the battle preserves the potential combat power of a force, so commanders can apply it favorably at the moment and the decisive place. Force protection is achieved by: protection against enemy land reconnaissance and air surveillance; hiding of device elements and activities of their own troops; creating the necessary conditions for the shelter and protection of combat personnel and techniques; maintaining the level of combat power of troops under the conditions of radioactive, biological and chemical contamination and the use of incendiary means; maintaining the health of staff and animals; environment protection. Protection is a complex function of the battle, which can not be fully quantified.

A great influence on the protection of troops is engineering preparation of the battlefield and masking. As is well known, masking greatly reduces the possibility of obtaining complete data about the enemy's goals, devices and actions. In order to solve the problems they require masking in the modern battlefield it is necessary to know the possibilities of the means and surveillance systems used by the enemy, the possibilities and characteristics enemy intelligence, as well as the technical conditions in order to obtain the masking effect, the different ways of the enemy's surveillance⁸.

It also follows from the definition and the content of the protection that it represents a set of measures and actions carried out both at the level of the management system (protection subsystem) and at the level of action (protection of the troops) in order to maintain the combat power of the tactical military structures. So, protection is a factor that multiplies (diminishes) the level of combat power and not a basic element of it.

"Survival" is a term that has been used in the NATO Armed Forces to describe the fundamental aspects of protecting the personnel, weapons and military materials from detecting the enemy. Referring to engineering preparation of the battlefield activity as part of the force protection, digging has generally been identified as a fundamental skill required by activities that increase the chances of survival troops. These have been proposed in the context of survival measures (requiring manual digging) including: preparation and construction of trenches; camouflage, masking and diversion (misleading); removal (obstacles, difficulties) in the firing field.

It is obvious that as the company advanced and the machines began to replace manual work everywhere, the number of people with the skills to dig out of the armed forces have been dramatically reduced. Lack of basic skills or specific training can lead to inefficient excavation and the emergence of medical problems for soldiers carrying out digging activities. That's why manual digging using tools should be included, at an early stage, within the training program.⁹

⁶ *F.T.-1 - Doctrina operațiilor forțelor terestre*, Statul Major General, București 2007, p. 21.

⁷ *Ibidem*, p. 22.

⁸ E. Chețe, *Confruntarea cercetare-mascare*, Editura A.I.S.M., București, 1999, p. 64.

⁹ F. Băițan, *Pregătirea fizică a militarilor din Armata României în contextul integrării în NATO*, teză de doctorat, Universitatea Națională de Apărare "Carol I", București, 2017, p. 181.

Therefore, all of the activities that make up the function of force protection, the most relevant, with a high level of physical demand, seem to be masking and engineering preparation of the battlefield, in which the digging and removal of residual materials are essential. If we take into account both the old and the modern military conflicts, we find that most of the military operations in which the performance of these activities were carried out at optimal standards proved to be indispensable for successful actions. Thus, we can assert that aspects of physiology of physical effort such as: aerobic power, isometric contractions of upper/lower body muscles and dynamic contractions against resistance (weight exercises) that provide not only an increase in strength but also an increase in resistance muscle to effort. By developing these aspects, the best performances are achieved in the digging activities, so it would be highly advisable to use them in specific training.¹⁰

So, the protection requirements are very important, the vulnerability of the forces being high, especially during displacement. That is why training needs to ensure reaction capacities in real-time, to use information technology at the individual level and organizational structure.

Surprising the enemy is a complex factor of the battle that can have a high level of multiplication of the combat power, in which we find the maneuver, the protection, the fire power, the intelligence advantage, the command, etc.

B. Environmental factors are: terrain, weather and seasons.

Influences and implications of environmental factors have been studied by many military analysts and specialists. They consider that environmental factors are important elements in the battlefield and may favor or hinder the conduct of combat operations in any theater of military operations.

The terrain has effects on mobility, defensive position, infantry weapon, aviation effectiveness, armour, etc. However, we can not believe that the influence of the land is the same on the infantry weapon with that on artillery, tanks, fighting machines, since, even if the operation takes place on the same ground, there are sufficient differences in the favoring or not of the actions and implicitly in the use of different terrain characteristics.

The terrain is considered by the level of engineering preparation of the battlefield and it is believed that its influence is different on the armament categories. Terrain engineering preparation of the battlefield must be a stand-alone factor, the assessment of which includes a number of elements or characteristics, such as: level differences; level of coverage with forests or other forms of vegetation (wheat, corn, pepper, orchards, reed, etc.); the existence and quality of the road and rail communication system; the existence and value of various natural and artificial barriers (lakes, rivers, irrigation channels, marshlands, etc.); the existence of hard-to-reach or inaccessible areas (massive mountains, precipices, flooded areas, etc.); density, configuration and nature of building materials of localities; the existence and scale of industrial platforms.

Recent military conflicts, especially in Afghanistan, have shown us how important the configuration of the terrain is. The predominantly mountainous relief, with many caves, allowed long-lasting resistance of insurgent forces in the so-called "safe havens" areas. Also, the rugged terrain, largely without vegetation, is often crossed by huge trenches created by torrential rains that ensured favorable conditions for the displacement and intimidation of the insurgent forces and a major disadvantage for the coalition forces which acted on the military technique, so they can easily be caught in ambush. This has created great problems for the leadership of troops in building and maintaining links and limiting continuous observation by insurgents. On the other hand, the land in that area, seemingly propitious for offensive

¹⁰ *Ibidem*, p. 182.

operations, has been and continues to be tied with improvised explosive devices on the roads, and after heavy rains or sand storms becomes a real trap for the coalition forces.

Certainly, military action in hard-to-reach areas requires special physical efforts for fighters, the military technique becomes overwhelmed, and if the equipping and endowment of troops do not reach the adequate level, it may end up failing to carry out the missions entrusted.

Weather is another factor of the battlefield that can influence combat actions. Temperature, humidity, wind are the climatic elements that interconnect and influence the mobility of the troops and the way in which the actions take place. Along with these elements, atmospheric pressure and brightness, as well as a series of meteorological phenomena (rain, fog, snow) can also be considered. It is obvious that if the terrain factor can favor or disadvantage the usefulness of a military structure, the atmospheric conditions can make it difficult or even stop the conduct of the battle¹¹.

We appreciate that psychophysical training and military specialized training performed under any weather conditions can attenuate the level of diminishing the combat potential of a tactical structure in an operational situation under adverse weather conditions. Temperature variations have an impact on weapon and military equipment but also on personnel, and the natural and artificial elements of the geospatial factor influence both the organization and conduct of military actions as well as the logistic support activity.

The season can influence combat action, as with atmospheric conditions. Military analysts believe that the season should be taken into account when planning, organizing, and conducting combat activities, especially knowing that seasons are different, depending on the relief.

Nature's actions and the effects of the environment give the third combatant status of battle because it interacts with the combat power of the forces in conflict. The state of the combat power of tactical units depends decisively on the choice and use of the terrain (the most important of the environmental factors) in which the battle will take place. The terrain should allow the use of the maximum weapons capabilities, ensure masking, protection and maneuvering of troops, reduce the ability to observe and mask the enemy.

Commanders of tactical structures need to know them in detail and use them in the most advantageous conditions in order to achieve a combat power appropriate to the mission entrusted. The Environmental Factors Index (EF) is determined using the formula: $EF = T \times W \times S$ (T – terrain factor; W – weather factor; S – season factor).

In conclusion, the military training process, in which physical training takes on a determinant role, rigorously executed under any weather conditions, in any season, day or night, contributes to the adjustment and increase of the psychophysical resistance of the body to sudden changes in temperature and pressure, to formation and development of resistance to long physical effort, to displacement troops in difficult conditions by terrain and climate.

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¹¹ V. Cegan, *Potențialul de luptă al unităților și marilor unități mecanizate*, Editura Academiei de Înalte Studii Militare, București, 2001, p. 54.

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*** *F.T.-I – Doctrina operațiilor forțelor terestre*, Statul Major General, București 2007.

SECURITY ISSUES IN THE BLACK SEA

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Abstract:

The Black Sea Basin area is particularly complex from the perspective of the security situation. The geostrategic status of the Black Sea as a regional security issue is closely linked to the European fight against terrorism and asymmetric threats. Security in the Black Sea Basin currently depends on the consistent involvement of the EU, the OSCE and NATO. The geopolitical configuration of the Black Sea area is in continuous dynamics and will continue in the future. The Black Sea area, with its implications in the area of resources and security, is an area where regional processes and phenomena occur and spread.

In this article, we intend to analyze the evolution of the security environment in the Black Sea region by analyzing the main actors and how they affect region security of the Black Sea.

Keywords: *security; the Black Sea; NATO; Turkey; Russian Federation.*

THE STRATEGIC IMPORTANCE OF THE BLACK SEA

The Black Sea basin area is particularly complex from the perspective of the security situation. This area is characterized by a redevelopment process of the regional security architecture as part of the Euro-Atlantic architecture, but also by the existence of an important conflict potential, caused both by the inter-state or frozen conflicts as well as by the amplification of the asymmetric threats, illicit trafficking in human beings and drugs, as well as terrorism or the phenomenon of migration.

The emergence of new NATO actors, Bulgaria and Romania, Georgia's and Ukraine's willingness to become members of the Alliance, and the development of NATO's relations with Ukraine create all the prerequisites for increasing security in this area. On the other hand, after the integration of Romania and Bulgaria into the European Union, its borders at the Black Sea can constitute a social stabilization, economic and political stabilization of this region.

THE SECURITY PROBLEM IN THE BLACK SEA

The expanded Black Sea area includes convergent elements, defining the division of the area in terms of security and identity, as well as divergent elements or diversity. Except for the six riparian countries, the extended Black Sea region has a stretch from the Caspian Sea to the Adriatic and Central Europe. Particularly important elements of this region are the geopolitics of oil and the geostrategic status of the area.¹

¹ Cornel Marinescu, *Considerații privind puterea navală în Zona Extinsă a Mării Negre*, Editura Muzeului Marinei Române, Constanța, 2009, p. 5.

The geostrategic status of the Black Sea as a regional security issue is closely linked to the European fight against terrorism and asymmetric threats. The Black Sea can be a barrier and an outpost of global and European struggle against asymmetric threats from the Middle East and Asia.²

The geopolitics of natural gas and oil supply routes highlight the importance of the link between the Black Sea and the Caspian Sea. The Black Sea is currently one of the major energy transport corridors around the world.

Sea security in the Black Sea is based on two pillars, coordination and cooperation between riparian states and the complementarity of global security systems.

Achieving the objective of improving maritime security can be accomplished by combining civilian and military efforts to ensure the legal use of maritime districts and the prevention of illegal activities.³ The Black Sea region has greatly increased the role in the Europe's energy and security concerns, giving Romania the status of a leading actor.

In specific times, considered a closed sea, with no strategic importance in modern conflicts the Black Sea significantly increased of its importance. In recent decades, after the transition to the Caspian Sea exploitation of oil fields and the increase of the commercial role of the Danube, but also due to the entry of Bulgaria and Romania into the Euro-Atlantic security and economic structures, one can observe the increase of the geopolitical value of the Black Sea.

Having the smallest portion of the coastline between the Black Sea riparian states, Romania still has an important place among them. Romania has the advantage of controlling the whole of the Lower Danube, the main springs of the Danube, the Danube-Black Sea Canal, along with the control of the major resources provided by the continental shelf of the sea. Romania's economy has a strong maritime component, with an increasing potential for exploiting marine resources and using the sea and river communication ways. Moreover, access to the sea is vital to the national economy and the well-being of our nation.⁴

Dobrogea has a strategic importance for Romania, ensuring its access to the seas and oceans of the world, as well as indirectly to the center and west of Europe. The seaside, delta and the mouth of the Danube, the Black Sea continental shelf, covered by the territorial sea, the contiguous and the high seas, included in the Exclusive Economic Zone, complete the importance and strategic role of this geographical area.

The sources, means and potential that define national maritime power are well identified. Under current economic conditions, they are less obvious.

For today's Romania, Constanta port, the country's main maritime harbor, the largest port of the Black Sea and one of the largest in Europe, with shipbuilding, repair and replenishment facilities connected by Central Europe and the North Sea, is, as in other times, an objective of utmost importance. Port of Constanta plays a particularly important role in future regional development projects, including the Black Sea Free Trade Area, and will act as a real turntable for commercial traffic between East and West.

THE SECURITY OF THE BLACK SEA – THE ROLE OF NATO AND THE USA

Security in this area currently depends on the consistent involvement of the EU, the OSCE and NATO, and even of state powers such as Germany, Britain, France, USA, as there is no unanimous conception of the future and status of each state area in part.

The political orientation of the smaller countries towards integration into NATO and the EU is the guarantor of the implementation of democratic, social and market economy

² Teodor Frunzeti, *Geostrategie*, București, Editura Centrului Tehnic al Armatei, 2009, p. 116.

³ *United Nations Convention on the Law of the Sea*, Washington D.C, 1982.

⁴ Ion Chiorcea, *Interesele la Dunăre a statelor riverane vecine României*, București, Editura Universității Naționale de Apărare „Carol I, 2006, p. 19.

principles, with a clear perspective on the resolution of frozen conflicts that are currently stifled in different places.⁵ The Russian Federation will not give up the long ago established expansionist politics in the Black Sea region, but it has territorial disputes and problems on the Ukrainian border. At the same time, it directly supports and encourages separatist actions (recognition and proclamation of independence) of Russians living in the southern and eastern regions of Ukraine, Abkhazia, Transnistria and North Ossetia, which wants to become Nova-Russia. The Russian Federation also wants to be treated like a large continental power with equal rights in terms of European security on the Atlantic coast at the eastern edge of Europe. Russia is interested in setting up the Eurasian organization, like the EU in its region of influence with the former CIS and Asian countries, including China.

The US uses the influence of this area as a starting point for control operations in the Middle East and the Caspian Sea, extremely rich in energy resources. European powers use the Black Sea as a connecting node to diversify the routes of energy sources that have a starting point for the Caspian Sea.

Contradictory with the situation of the countries and regions of the former USSR, the countries in the eastern flank of NATO, Romania, Turkey and Bulgaria, all of them with the Black Sea exit, have an important task by stopping and discouraging destabilizing actions that manifest in the area in which we live. The intensification of NATO joint exercises, the development of US military bases in these countries, the increase of NATO military presence in the air, on water or on land, have a deterrent effect on any action against the territories and populations of NATO and EU member states. These joint actions of the allies in the eastern and southeastern regions increase the trust of the population and show at the same time the unity of the Alliance.

I must point out that, in present, security architecture is not implemented in the Black Sea, the use of force remaining a clear option for achieving political goals in the area. The main actors with an important contribution to shaping a security dynamics are NATO and the EU, Turkey, Russia as well as the USA. NATO became a particularly important actor in the Black Sea in 1952, after the integration of Greece and Turkey into the alliance, but also in 2004 after accepting as members of Romania and Bulgaria. Considered "Russian Lake" during the Cold War, the Black Sea is today far from being called "NATO Lake". The events in Ukraine have proved the failure of the Eastern Partnership of the United Nations and the inability of NATO to expand to Ukraine or Georgia within a reasonable timeframe. We can say, however, that NATO's role to protect members of Eastern Europe has increased. If, in the 2000s, the US had a proactive role in the Black Sea, after Barak Obama's election at the head of the state, involvement in the area decreased. The annexation of the Crimean Peninsula in 2014, and the unilateral actions of Russia in Ukraine, has led to a change in the US attitude in the Black Sea area.

Washington's involvement in this region has intensified, in the field of energy security, the defense against ballistic missiles with components disposed in Romania and Turkey through NATO defense programs, and programs for the establishment of new operative positions in the eastern area NATO, in line with the decisions taken at the NATO Summit in September 2014 in Wales and following the decisions of the July 2016 Summit in Warsaw. Except for these measures, Washington also needs active cooperation with Moscow to solve international issues, including the security situation in the Black Sea area. Washington is a competitor for the Russian Federation in the "sphere of privileged interests", the relations between the two big powers being tense and having a negative impact on the security policy of the Black Sea area.

At the same time, the US is putting pressure on the U.E. to take the initiative in the region and to try to involve Turkey to a greater extent in solving the problem of refugees from the Middle East and regional conflicts (Nagorno-Karabakh, Cyprus).

⁵ *National Strategy for Maritime Security*, Washington D.C., 2005, Chapter I.

Inability of U.E. to have control over the situation in the Black Sea, corroborated with the relatively low presence in the area of both NATO and US, can lead to a revival of Russia-Turkey relations, the tandem to take the initiative to control the security situation in the area.

The Montreux Convention grants Ankara, controlling the Bosphorus and Dardanelles, the Turkish fleet being the most powerful and efficient in the region from the military perspective. Turkey is concerned to involve all riparian countries, including the Russian Federation, in all the maritime security commitments of the area, its objective being to maintain the military balance in the Black Sea. Thus, in order to strengthen regional confidence and increase cooperation in the security spectrum, Turkey had in 2001 the initiative of setting up the BlackSeaFor naval group. The naval group was made up of military ships belonging to the Black Sea riparian states, activating twice in a calendar year to carry out a wide range of exercises, such as environmental protection, search and rescue at sea, anti-submarine struggle, etc. In 2004, Ankara expanded its initiatives by launching the Black Sea Harmony operation. Its purpose is to prevent and fight piracy and terrorism. In 2006, Washington suggested the expansion of Operation Active Endeavor in the Black Sea without success, Moscow and Ankara opposed categorically. Turkey has argued that riparian countries can only secure maritime security in the Black Sea and Russia has considered a problem implementing the Montreux Convention in the context of the growth of naval activity. Even though Ankara has always supported the need for Moscow to address security issues in the Black Sea, the other riparian countries have not been overlooked, being invited to contribute each to the two BlackSeaFor and Black Sea Harmony regional initiatives

THE SECURITY OF THE BLACK SEA – THE ROLE OF TURKEY

Strategic and geopolitical stakes have always been high in the Black Sea region. Regional development, both positive and negative, continues to influence the vital interest of countries and peoples living along the seashore, sending reverberations far beyond its limits.⁶ For countries like Turkey and Romania, because they are in a strategic partnership, it is important to correctly identify the inevitable challenges in a period of unprecedented change. Scientific and academic research in the communities of the two countries has an important role to play in this regard, by sharing concepts, analyzing approaches, and looking for appropriate responses to the increasingly complicated issues that we all have to face.

Since the ancient and medieval times, the Black Sea has been the point of intersection of the flowering civilization and sometimes bitter rivalry, political supremacy, or control of maritime trade.⁷ This was the reason why in the Crimean War of 1853-1856 most of the European countries joined Turkey to prevent Russia's empire from achieving ambitions in the region.

The Ankara political-military authorities believe that the dangers, risks and sources of current insecurity towards Turkey are very different from those during the Cold War.

In this context, Turkey, located in the south-eastern flank of NATO, is located in the same time at the center of the most volatile region covering the Caucasus, the Balkan Peninsula and the Middle East.

Turkey's military policy has a defensive character and has been developed in order to maintain the country's independence, sovereignty, territorial integrity and vital interests. This policy also aims to contribute to ensuring a climate of regional peace and security.

The opinion of Turkish political-military authorities is that in case of a dispute, the first way to regulate it must be the dialogue and peaceful political means. The most important principles of Turkey's defense and defense policy are as follows: "peace in the country, peace

⁶ Ronald Asmus, Konstantin Dimitrov, Joerg Forbrig, *O nouă strategie euro-atlantică pentru regiunea Mării Negre*, București, Editura IRSI, 2004, p. 8.

⁷ *Ibidem*, p. 16.

out", Turkey's consistent and active participation in the settlement of international disputes and in ensuring a just and lasting peace, securing and preserving the independence and integrity of the republic, taking all necessary measures to prevent crises and conflicts, Turkey's active involvement in collective defense systems and the effective fulfillment of all its responsibilities in this context.

Turkey's military strategy consists of four major points reinforcing the aforementioned defense policy, as follows:

1. Discouraging – in the environment of uncertainty and instability surrounding Turkey, the Turkish state ensures the development and maintenance of a military capability that will have a deterrent impact on any enemy, internal and external potential, discouraging as the basic argument of Turkey's military strategy.

2. Collective security – Active involvement in regional and international political and military alliances and institutions, especially within NATO and U.E.O. (ESDI), continues to be a fundamental element of the Turkish National Military Strategy. The basis of the concept of collective security is to continue to ensure military power, participation in international political and military organizations and alliances, cooperation with their Member States in the fields of technical assistance and training for combat in accordance with the foreign and security policy of the state Turkish.

3. Advanced Defense – the basis for advanced defense is the identification as early as possible of any possible conflict and its timely resolution in the event that the Turkish nation could become the subject of such an external conflict.

4. Active military participation in crisis management and international interventions in crisis areas. This is one of the most important elements of the Turkish military strategy and aims at ensuring the capacity of the Turkish Armed Forces to participate in conflict relief operations, preventing the transformation of these conflicting states into armed conflicts, participating in peace settlement efforts, in accordance with diplomatic, economic and crisis management measures adopted in connection with a crisis that could affect Turkey's national security. It also entails ensuring that the Turkish Armed Forces have the capacity to intervene in any crisis situation other than regional ones that is likely to endanger peace and human rights in accordance with the fundamental national interests of the Turkish State and in line with the political decisions adopted by the UN Security Council and within the military alliances of which Turkey is part, in order to achieve and maintain world peace.

It is of the utmost importance to ensure the establishment of a structure of the Turkish Armed Forces compatible with the defense policy and the military strategy of Turkey, in particular, within the meaning of the four above mentioned points. Given that Turkey is the subject of internal and external multidimensional dangers in terms of its geopolitical and geostrategic location, the achievement of a military power capable of strengthening national security policy, maintenance, development and modernization of this military power, depending on the circumstances and requirements of the century XXI, are fundamental elements in Turkey's defense policy and military strategy.

Turkey currently has a total of 805,000 soldiers, ranked sixth in the world, after China (2.93 million), US (1.62 million), Russia (1.4 million), India (1.26 million), North Korea (1.04 million).

Regarding the energy, Turkey is the state that provides the transit of hydrocarbons extracted from the Caspian Sea. The signed contracts give an involvement in both the European Union's energy policy and the Russian Federation's policy by delivering the resources at his disposal. Despite de fact that is the political and diplomatic link between Eastern and Western Europe, Turkey pads on the idea of joining the European Union without making any great efforts to achieve it. Turkey has not always agreed with the allies or neighbors' ideas (for example the Syrian issue, claiming insurgents/rebels, contrary to Russia, or a different opinion from that of the US on the Israeli and Iranian issues).

Concluding, I believe that Turkey has a decisive role in this Black Sea area, being also a NATO member state, a guarantor of the security of energy routes due to the strategic

position linking the Black Sea with the Middle East, routes that can feed the countries of Western and Central Europe with gas and Caspian oil. Against the backdrop of the contradictions between the states in the area, there is a problem in influencing the maritime or military trade routes with the Mediterranean Sea. Divergences between the two NATO countries, Greece and Turkey, can create different bottlenecks as well as difficult situations for other Black Sea riparian states, especially a provocative situation for the Russian Federation, with the Military Maritime Flight stationed in Crimea Port.

RUSSIAN FEDERATION – THE MAIN BLACK SEA INSECURITY SUPPLIER

"The Russian power in the conflict in Syria was overestimated; however, the danger posed by Moscow to Ukraine and Europe was underestimated. However, the two issues are interconnected".

In 2015, Russian President Vladimir Putin and his foreign strategy strategists seemed to have succeeded in using the already proven masquerading tactics of the Soviet Army and the Soviet intelligence community to incite the West error and distract from the real objectives of the Russian Federation.

The Russian military intervention in the war in Syria has surprised and even somewhat frightened the West. Vladimir Putin's decision to get involved in this theater created the impression of political power on both fronts, internally and internationally. The true secret behind this assumed power is essentially the weakness of the European Union and the US, which showed little interest in interfering in the four-year Syrian war. The terrorist threat to the Islamic State, as well as the refugee crisis or the emergence of Russian combat units, has led the West to increase its involvement.

However, the power of the Russian Federation in the Syrian War should not be overestimated. As a permanent member of the UN Security Council, the Russian Federation has always had enough means to undermine the foreign policy of the West. The Kremlin has increased its chances in Syria by building an airbase in Latakia and launching several cruise missiles on ships. However, no one should be misled by these tactics that involve the use of force, even before; Moscow is helping his protector (the president, Syrian, Bashar Al-Assad) by offering diplomatic and military support.

Under no circumstances will the Russian Federation be able to define a new military order after its military involvement in Syria, the regional powers in the Middle East as well as warring parties make the situation extremely complex, and Moscow's strategies are aware of this thing. Deploying military capabilities in Syria the Russian Federation has induced a state of anger on its enemy, the US and, in particular, Saudi Arabia, which is a welcome side effect for Russian leadership. In fact, the main state responsible for reducing the price of oil, so important for the Russian Federation is Saudi Arabia.

The increased involvement of the Russian Federation in Syria can only be understood if it is analyzed from the point of view of Ukraine. On the one hand, Vladimir Putin wants the sanctions imposed on his country to be reduced. On the other hand, it wants Ukraine to be destabilized in such a way that its way to Europe is obstructed. This is the goal served by Moscow – dependent power structures in eastern Ukraine, the so-called Donetsk People's Republic (RPD) and Luhansk People's Republic (RPL), respectively. Their existence would call into question whether the Minsk II agreement would be fully implemented and that Kiev would take over its border with the Russian Federation. Full implementation of the Minsk II agreement is a precondition for lifting Western sanctions. Instead, Moscow is working to ensure that the situation in Donbass turns into what is called a "frozen conflict," and the practical Ukrainian politicians play the game of Moscow, as they find hesitant to change the constitution offer greater autonomy to the regions, especially the disputed Eastern region, as provided for in the Minsk II agreement.

It will be important to see the reaction of European allies. Despite fears about an imminent Russian threat, most European states have not committed themselves to making

even modest increases in their defense budgets, except for Romania. A US announcement on the increase in defense spending (in Europe) that is received as a relief in European capitals and would not lead to increases in defense budgets across Europe (or even would be an excuse for new cuts) would have ultimately a minimal impact.

The Russian Federation has the advantage of "own land" along its western frontiers. The US may temporarily strengthen its military presence in Central and Eastern Europe, but ultimately the Russian Federation has the ability to rapidly mobilize a large number of forces. Moscow's ability to dissipate its true intentions by performing unannounced military exercises and exercises to increase combat preparedness has improved significantly in recent years. Some experts claim the need to deploy at least two full armored brigades, assisted by several naval and airborne capabilities to provide a real deterrent. The same experts argue that the current plan is rather an effort to send a signal, not a real attempt to build the American element of strategic discouragement in Europe.

Thus, the question that has not yet been answered is: what will happen to the borders between the NATO member states and the Russian Federation? The possibility of Moscow considering a "march" to Warsaw is quite low. US forces and other NATO forces stationed in NATO member states can increase Member States' defense capabilities but will change US presence in Poland or Romania Strategic calculations of the Russian Federation in relations with non-NATO countries such as Ukraine and Georgia? In this regard, Moscow may be willing to continue to provoke the West despite its rhetoric; NATO has admitted that these states are outside effective Western protection.

When NATO leaders met in Warsaw for the North Atlantic Alliance summit, they announced measures to strengthen the presence of conventional allied military forces on the eastern flank. At the same time, NATO briefly announced that the missile defense system in Romania, endowed with SM-3 interceptors, has reached operational status. These measures have led the Russian Federation to announce triumphantly the development of "countermeasures", but these are measures that Moscow intends to adopt anyway, regardless of the evolution of the events.

Iskander missile dismantling in Kaliningrad can be considered a counter-measure of the Russian Federation against NATO. Western analysts have been waiting for a few years to deploy them as part of the current process of modernizing the Russian Armed Forces. Another possible counter-measure, this time close to Romania, would involve the deployment of Iskander missiles and strategic Tu-22M bombers (NATO's "Backfire") in the Crimea.

Returning to the implications of the Russian Federation in the Black Sea area, Romania and Bulgaria are increasingly exposed to the pressure in this area, whose control is defined as an essential component of the policy of the Russian Federation to reaffirm itself as the main power pole in the Eurasian area.

By manipulating the idea of "Great Romania," the Kremlin's strategy in the Black Sea is to promote the regional dispute with the Republic of Moldova and Ukraine and to support the separatist activities of the Transylvanian Szeklers. After the annexation of the Crimea, the exploitation of Romania's Black Sea resources was disturbed by the legal dispute over the territorial waters claimed by the Russian Federation.

The increasing exposure of Bulgaria and Romania to Moscow's pressure has increased through the neglect by the US and NATO of the Black Sea security flank, but also with the neutralization of the eastern and northern seas by Russia by conquering Crimea. The Russian Federation has deployed many missile-carrying ships and aircraft in the region, and the Crimean Iskander missiles have placed the whole Black Sea coast within the range of nuclear and conventional missiles.

NATO has a limited its presence in the Black Sea, whereas U.E. appears to be unable to manage the region's security environment, while US interest and influence over President

Barack Obama's two mandates have been very low. On the other hand, the organizations responsible for regional cooperation in the Black Sea area, as well as the various NATO bodies, have also proved to be inefficient and weak, while Romania's and Bulgaria's military capabilities are insufficient to dissuade the Federation's actions Ruse.

Moscow's non-military and military escalation is a threat to Romania and Bulgaria, two well-exposed NATO member states, Moscow's naval capabilities far superior to those of the two countries, while the Montreux Convention is conditional on NATO operations at the Sea Black, the military ships of non riparian states, unable to stay in this area for more than 21 days.

Having a limited capacity to design a military power image, except for the regular NATO exercises in the Black Sea, Romania can not cope with a strongly militarized Black Sea area capable of endangering the energy resources currently explored by our country, as well as commercial routes . The possible effects of the security crisis may restrict the links between the Black Sea and Danube ports of Central Europe, may block the Danube-Black Sea channel, or even limit trade links with non-EU countries, such as Turkey. Extending the war "through the intermediary" led the Russian Federation to Odessa as well as the Ukrainian side of the Danube Delta could suffocate this particularly important artery and cause significant losses for the countries that use the Danube as the main commercial point of access to the center of Europe.

The presence of the naval forces of the riparian states, Romania, Bulgaria, Ukraine and Georgia does not amount to the level of presence of the Russian Federation in the areal, while substantial, unsupported Turkish naval forces can not pose a challenge for Russia, self-proclaimed regional naval military power. The weak naval force of the two NATO member states is the main problem. From the point of view of the naval forces, the Romanian army is based on the three old-generation frigates, supported by four corvettes and three missile-carrying ships. The outdated military capabilities of our country, but also the extremely slow pace of modernization of anti-ship, anti-aircraft and anti-missile systems represents an advantage in favor of Moscow.

The military side of the Russian Federation's strategy implies exploiting effective control over the Black Sea, putting pressure on the riparian countries, Romania, Ukraine, Bulgaria and Georgia. After conquering the Crimean Peninsula, Russia gained control over hundreds of kilometers of coast but perhaps the most important aspect of access to the Sevastopol port, thus gaining a maritime area almost three times larger than the Crimean Peninsula.

Kremlin's priorities are the modernization and expansion of the Black Sea Fleet, Russia intends to increase its military presence in the Crimea by 2020 and build new military infrastructure in the Georgian separatist region of Abkhazia while also deploying mobile missile launch capabilities the coast. In fact, the Russian Federation does nothing but build a naval and air defense network in order to threaten and even finally prohibit access to the Black Sea for fleets belonging to other coastal states.

Control over the Black Sea is the essential component of the revisionist policy of the Russian Federation in the desperate attempt to become a pole of power in the Eurasian area, and is at the same time an attempt to cancel the progress made in the region by NATO over the past two decades. The objective of the Kremlin is to protect the southern flank, but also to intimidate its unprotected and exposed neighbors, basically forbidding the accession of NATO, Moldova, Ukraine and Georgia. Speaking about Romania and Bulgaria, the aim of the Russian Federation is to neutralize the eastern flank of NATO, ensuring that the governments of these states do not oppose its international offensive and that NATO can not discourage its ship-ship dislocation.

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OPSEC – A BASIC COMPONENT IN THE PROTECTION OF CRITICAL INFORMATION

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Abstract:

Operations security/OPSEC is a process to deny potential adversaries information about capabilities and/or intentions by identifying, controlling, and protecting unclassified information that gives evidence of the planning and execution of sensitive activities. It is just as applicable to sensitive activities.

This article aims to highlight the fact that although OPSEC is not a panacea for every security challenge, if done properly, can minimize the risk of compromising information that could assist our adversaries in degrading our mission effectiveness.

OPSEC must become a way of thinking of all personnel in the army, and to be permanently applied.

Keywords: *OPSEC; operations security; protecting unclassified information, sensitive activities; adversary; army.*

Information is power when kept properly and may be cause of failure if it is not conducted and managed in the right way. Today information technologies and global networks enable risk factors to spread more easily as compare to previous eras in the human history. Safety and security of a society cannot be maintained just by security personnel of a country. In accordance with law and human rights values all society and individuals need to take a role for securing today and the future of humanity. At the beginning of 21st Century, scholarly, scientific and academic interaction is at its highest level. This is a big advantage for universal human values and world peace. In defense and strategic studies, as well as security sciences, the international exchange of knowledge has always been effective. As part of the globalization of knowledge, the scientific models and methodologies in this article we will focus on OPSEC (Operations Security), a model designed and improved in the United States of America. Although the majority of researches on OPSEC have been conducted in the US, there are still a lot of aspects for its concepts to be analyzed, researched and discussed in other parts of the World.

OPSEC History and Background

OPSEC has been practiced for thousands of years. When Sun Tzu wrote in 'The Art of War' (6th Century BC, China), "Secret operations are essential in war; upon them the army relies to make its every move", he was describing an early understanding of OPSEC. When George Washington said, "Even minutiae should have a place in our collection, for things of a seemingly trifling nature, when enjoined with others of a more serious cast, may lead to

valuable conclusion”¹ he, too, was demonstrating a solid understanding of what we now call "OPSEC". General Washington was not speaking of communication nodes or computer networks, but his message is clear and still valid today. As a known OPSEC practitioner, he knew that a thinking adversary could connect the bits of information gained from observation and listening skills and derive intelligence from information. The attempt to prevent any information leaks that transform into something that when viewed as a whole could affect the army’s future operations or intentions remained foremost in his mind. General Washington’s abilities to keep information secure helped set the stage to extract his army and keep its fighting power intact while being pursued by the British Army during the American Revolution. His abilities to slip away and continue to gain information on British and Hessian forces facilitated his victories at Trenton and Princeton, while keeping the enemy guessing of his intentions.

During the First World War, Operations Security was governed by a series of notes and directives issued by the American Expeditionary Force (AEF) Chief press officer, American Military Attaché in London, Secretary of State or the (AEF) Chief of Intelligence.² Covering the period from 25 June 1917 through 18 November 1918, the policies were amended on thirteen occasions. The significant additions that most resemble today’s guidelines were issued on April 2nd, 1918. In the memo from the Chief of G-2(D), a list of topics covered the primary security and censorship issues of the time. Guidelines were issued on identification of troops by state, unit number or component, place locations, ship movements, army plans (real or possible), effects of enemy fire, casualties including individual dead or wounded names.³ “In brief whatever will be printed which tends to injure the position of the United States in the congress of nations or the position of American soldiers in Europe”⁴.

Regarding the position of soldiers in Europe, the consequences of poor OPSEC and the direct result can be gleaned from an event that took place on November 10 th, 1918. During an operation for the 356th Infantry, two of its’ organic battalions, 1st and 3rd, were able to use proper security measures and surprise to effectively cross a river at night with minimal casualties. The regiment’s actions to safeguard the plan included issuance of orders to few officers and muffling of oars and boards on the boats. Both practices highlighted security concerns and secrecy. However, the 2nd battalion arrived at its designated crossing point at 2100 and was unable to cross until 0100 a.m. While waiting, the battalion was detected and received German artillery fire upon its positions. The resulting effects killed or wounded 232 of 600 soldiers including the battalion commander and most of his officers.⁵ Although the example is tactical in nature, one must conclude that two battalions succeeded in their security practices while one was 3 compromised. Proper OPSEC procedures had a profound effect on the 356th Infantry’s mission accomplishment. The mission was accomplished and the objective taken, but the resulting casualties in one unit were deemed very high by most standards, 38%.

Security measures also encompassed more than the battlefield actions within the unit. In particular, comments on casualties and effects of enemy fire transcend time in that they are still problems today. In 1918, the issue or publication of names killed or wounded prior to

¹ U.S. Department of Energy, *An Operational Security (OPSEC) Primer*, Washington D.C.: Department of Energy, available from <http://www.defendamerica.mil/articles/a021202b.html>; Internet.

² U.S. Department of the Army, *Reports of the Commander in Chief, Staff Sections and Services, AcofS-G-2, GHQ, AEF*, vol 13 (Washington D.C.: Center of Military History, 1991, First Published 1948, CMH Pub 23-19), pp. 81-90.

³ *Ibid.*, p. 87.

⁴ *Ibid.*, p. 90.

⁵ The Infantry Journal Incorporated, “Surprise,” *Infantry in Battle*, 2nd ed. (Washington D.C., The Infantry Journal Incorporated, 1939; reprint, Washington D.C.: Center of Military History, 1997), pp. 110-112.

family notification was illustrated clearly as a concern. The thirst for public information and operational security measures required significant coordination between the Intelligence officer, Press officer and the Department of State representatives. As the United States entered the Second World War, similar issues remained relevant and guidance expanded into actions taken by soldiers in the event of capture. During the Second World War, security reminders produced through the Office of War Information used posters and catch phrases to illustrate security concerns. “Loose lips might sink ships” and “Somebody talked”, the heart rendering poster showing a sad puppy, Gold Star banner indicating a serviceman killed in action and naval tunic over the back of a living room chair became synonymous with the public security effort. All designed to ensure the military and general populations were aware of the potential enemy collection effort that affected successful pursuit of the United States war effort. An additional poster, maintained “The enemy is listening: He wants to know what you know, Keep it to yourself”⁶. Focused primarily on spoken words, conversations and written mail, the awareness program was designed to prevent an adversary from obtaining any information that could provide advantage. Additionally, the government issued rules of conduct to soldiers departing for overseas duty.⁷ Within the rules were instructions on writing home, talk and capture. The rules highlighted ten prohibited subjects. They include discussion of casualties, effects of enemy operations, plans or forecasts for future operations and movements of troops, aircraft or ships.⁸ The soldiers had to be constantly reminded to beware of enemy efforts designed to piece together information into something that would impact on operations.

A significant OPSEC breach in the Second World War was the compromise of the radar direction system “Eureka”⁹. This system, used for special operations insertions by the Office of Strategic Services (OSS) to pinpoint drop zones for equipment and personnel, appears to have been compromised as early as 1942, without the Allies knowledge. Using captured German documents, it appears that not only did the Germans ascertain the purpose of the devices, but they employed captured equipment in deception and decoy operations. The Allies use of limited frequencies and limited use of security devices such as a Morse code key greatly facilitated German efforts to gain complete information. As the war continued into 1943-44, the “Eureka” compromise resulted in misdirected air drops of equipment, and capture or elimination of OSS teams attempting to link with resistance fighters. After capture by the German forces, it became apparent to surviving team members that German Intelligence possessed significant knowledge of the key locations and instructors within OSS bases in England and Italy. The Germans were also exceptionally informed about OSS operational procedures. One captured radio operator from OSS team Tacoma was quoted “they knew more than I did about the outfit.”¹⁰ The losses in equipment and personnel became significant throughout the war and the Germans exploited the captured radio equipment and proceeded to capture a growing number of Allied special operations personnel.¹¹ The enemy successfully gained information and used it to their advantage. It was painstakingly clear that the lack of security consciousness impacted the operational efforts of the Allied war effort. Increased focus on OPSEC policy or training could have helped some of the effort to derail the German intelligence effort. It wasn’t until the late 1960’s in Southeast Asia, that the

⁶ U.S. Department of Energy, *An Operational Security (OPSEC) Primer*, 1.

⁷ “Loose Lips Sink Ships”, *Eye Witness to History* (1997) available from <http://www.eyewitnesstohistory.com>; Internet; accessed 11 December 2005, p. 1.

⁸ *Ibid.*, p. 1-2.

⁹ Chris Burton, “The Eureka-Rebecca Compromises: Another Look at Special Operations Security During World War II,” *Air Power History*. Washington: Winter 2005. Vol. 52, Iss. 4 [database on line]; available from ProQuest; accessed 14 January 2006, p. 2.

¹⁰ *Ibid.*, p. 8.

¹¹ *Ibid.*, p. 11.

OPSEC methodology known today had its origins.¹² Faced with the enemy gaining advanced knowledge of operations, a team was established to ascertain how the enemy gained information. As an additional focus the team was also tasked to find out how to combat the problem. The team found out that although on a small scale security and intelligence counter measures existed, they were insufficient to counter the enemy's efforts to gain information.¹³ Once the team analyzed current practices and security methods the concepts of a large scale Operations Security program were initiated. The team then made recommendations to commanders who implemented the counter security policies. The acronym OPSEC became synonymous with a concerted national effort that affected government agencies, the military, research and development and industry. Although timely and important, it wasn't until 1988, twenty years later, that the formal National Operations Security Program was established with specific guidelines and requirements assigned to federal agencies.¹⁴

What is OPSEC?

As important as the concept of operations security is, it is also one of the most misunderstood concepts of warfare. The title itself "operations security" is misleading and might be changed someday but that futile debate has already been going on for some time. OPSEC is often confused with strictly controlling the distribution and protection of sensitive or classified information like a security discipline. Operations security goes beyond the mission of traditional security disciplines.

Operations security is a systematic, proven process that identifies, controls, and protects generally sensitive but unclassified information about a mission, operation, or activity. This information about our intentions, capabilities, or activities is known as critical information may allow an adversary to gain a significant military, law enforcement, economic, political or technological advantage. That advantage becomes significant if it prevents an organization from effectively completing its assigned missions.

When effectively employed, OPSEC denies or mitigates an adversary's ability to compromise or interrupt a mission, operation, or activity. Without a coordinated effort to maintain the essential secrecy of plans and operations, our enemies can forecast, frustrate, or defeat major military operations. Good OPSEC helps to blind our enemies, forcing them to make decisions with insufficient information. It is not considered merely as "a security, intelligence, or information assurance (IA) function"¹⁵.

Intelligence is systematic coordination of activities which "provide information on adversary forces, governments, and intentions"; counterintelligence is performance of information gathering and conducting activities "to protect against espionage, other intelligence activities, sabotage, or assassinations conducted by or on behalf of foreign governments or elements thereof, foreign organizations, foreign persons, or international terrorist activities"¹⁶. OPSEC overlaps with these activities and they are mutually supporting each other. So, it can be said that although OPSEC is not an intelligence activity essentially its proper usage can be helpful to general intelligence strategies from many aspects. In 21st Century when we are talking about intelligence it is not just about official activities of all states, this is also highly connected to private activities of global or national companies as well, since corporate security and business intelligence have a growing importance in today's

¹² U.S. Department of Energy, *An Operational Security (OPSEC) Primer*, p. 1.

¹³ *Ibidem*, p. 2.

¹⁴ The White House, *National Operations Security Program*, National Security Decision Directive Number 298, (Washington D.C.: The White House, 22 January 1988), p. 2.

¹⁵ MCO 3070.2A, *The Marine Corps Operations Security (OPSEC) Program*, Department of the Navy, Washington DC 2013, p. 12.

¹⁶ *Ibidem*.

economy. So, OPSEC is a supportive model in private sector as well. OPSEC's being "a process" is seen as its "most important characteristic" and "OPSEC is not a collection of specific rules and instructions that can be applied to every operation. It is a methodology that can be applied to any operation or activity for the purpose of denying critical information to an adversary"¹⁷. As a process it is very adaptable to different variations of operations with a suitable flexibility of principles. Its principles are not solid "rules" or "orders"; just a foundation which show where and how to focus.

The structure

Adversaries may change according to organization, mission or context. Regardless the place it is applied OPSEC aims to give a possibility to look at to the picture from the perspective of potential adversary. As a practical tool it makes your understanding possible how your adversaries may grow their information about your organization and its activities. OPSEC concept provides an opportunity for threat analyses and create countermeasures for their prevention. As a living methodology it can be applied into any sector (state or private), operation, strategy and individual case. It is possible to be conducted in a very low-cost and can be seen as a "mindset" or "way of life"¹⁸. This simplicity and functionality have made the model's surviving possible for half a century.

An OPSEC program utilizes the five-step process. The OPSEC process can apply to any plan, operation, program, project, or activity. It provides a framework for the systematic and continuous process necessary to identify and protect critical information. OPSEC uses the following steps¹⁹: identification of critical information – determine what information needs protection; analysis of threats – identify the adversaries and how they can collect information; analysis of vulnerabilities – analyze what critical information friendly forces are exposing; assessment of risk – assess what protective measures should be implemented; application of appropriate OPSEC measures that protect critical information.

Identification of critical information/CI represents the first step. The purpose of this step is to determine what needs protection. This is one of the most difficult steps of the five-step process and is the most important to accomplish. OPSEC cannot protect everything, so the most important items should be afforded the greatest efforts of protection.

Critical information consists of specific facts about friendly intentions, capabilities, limitations, and activities vitally needed by adversaries for them to plan and act effectively so as to guarantee failure or unacceptable consequences for friendly mission accomplishment. Critical information is information that is vital to a mission that if an adversary obtains it, correctly analyzes it, and acts upon it; the compromise of this information could prevent or seriously degrade mission success. Critical information can be classified information or unclassified information. OPSEC measures protect the unclassified indicators that can reveal classified information.

It should be noted, however, that "information that is critical in one phase of the mission may not be critical in subsequent phases"²⁰. So, for each case and context CI has to be defined separately.

Analysis of threats represents the second step. Understanding and analyzing capabilities of adversaries are the main points of this step. By this way you can see that which kind of information they are looking for, who are your potential adversaries, how they try to

¹⁷ Joint Pub 3-54, Joint Doctrine for Operations Security, Department of the Navy, Washington DC 1997, p. I-1.

¹⁸ OSPA, Operations Security, The Operations Security Professional's Association, 2009, www.opsecprofessionals.org, pp. 6-9.

¹⁹ Army Regulation 530-1, *Operations and Signal Security Operations Security*, p. 11

²⁰ MCWP 3-40.9, *Operations Security (OPSEC)*, Department of the Navy, Washington DC 2009, p. 3-2.

get information, etc.²¹ Adversaries' "collection activities target actions and open source information to obtain and exploit indicators that will negatively affect the mission"²². Relevant and updated information on threats "is critical in developing appropriate OPSEC protective measures. The threat assessment (TA) step in the OPSEC process includes identifying potential adversaries and their associated capabilities, limitations, and intentions to collect, analyze, and use knowledge of our CI against us"²³.

Methodology is as follow:

- In coordination with the intelligence staff and all other staff elements, examine each part of the activity/operation to find actions or information that will provide indicators in each area (personnel, logistics, communications, movement activities, aviation, and so forth).
- Compare the identified indicators with the adversary's intelligence collection capabilities. A vulnerability exists when the adversary can collect an indicator of critical information, correctly analyze the information, make a decision, and take timely action to adversely influence, degrade, or prevent friendly operations. One method to use is to develop a "mission timeline." Identify along the timeline anything the commander has stated he or she wants protected.
- Have each staff element/participant in the action/operation identify along the "timeline," actions that "must be accomplished" in order for the mission to be accomplished.
- Identify which of these "must be accomplished" actions will be indicators an adversary could use. Now, compare each indicator with each of the adversary's collection capabilities. Where there is a match, there is a vulnerability. This step is crucial to go further and set effective solutions to security problems.

In *Analysis of vulnerabilities* step you need to focus on your vulnerabilities. What are the vulnerable points of your organization? From where adversaries may give harm to your activities? These are essential questions for this analysis²⁴. The aim with these questions and analysis "is to identify each vulnerability and draft tentative OPSEC measures addressing those vulnerabilities. The most desirable measures provide needed protection at the least amount of cost to operational effectiveness and efficiency"²⁵. In military, security or business operations "Weaknesses that reveal CI through collected and analyzed indicators create vulnerabilities. Indicators are those friendly actions and information that adversary intelligence efforts can potentially detect or obtain and then interpret to derive friendly CI"²⁶. There are three categories of measures to accomplish this:

- Action control consists of measures to control friendly activities. Action control can eliminate or reduce indicators or the vulnerability of actions to exploitation by adversary intelligence systems to an acceptable level. Select what actions to undertake, decide whether or not to execute actions, or impose restraints on actions (trash control, mandatory use of secure communications, OPSEC reviews, and so forth) Specify who, when, where, and how.
- Measures disrupt the adversary's information gathering or prevent their recognition of indicators when collected materials are processed. Use diversions, camouflage, concealment, jamming, deterrence, police powers, and force against adversary information gathering and processing capabilities.

²¹ *Ibidem*.

²² III CORPS & FH REG 530-1, Operations Security OPSEC Program, Department of the Army, Fort Hood, TX 2017, p. 31.

²³ OSPA, Operations Security, The Operations Security Professional's Association, 2009, www.opsecprofessionals.org, p. 33.

²⁴ OPSA..., p. 33.

²⁵ III CORPS & FH REG 530-1..., p. 31.

²⁶ MCWP 3-40.9, Operations Security (OPSEC), Department of the Navy, Washington DC 2009, pp. 3-4.

– Counter analysis is directed at the adversary analyst to prevent accurate interpretations of indicators during adversary analysis of collected material. Confuse the adversary analyst through deception techniques, such as cover.

When you can see your vulnerabilities clearly to arrange proper measures would be more possible and successful.

Risk Assessment is the third step. After analyzing its vulnerabilities an organization needs to assess potential risks. OPSEC professionals, based on this risk assessment will decide what are needed effective countermeasures²⁷. OPSEC concepts require “managing all dimensions of risk to maximize mission effectiveness and sustain readiness”²⁸. This level has two important points: “First, OPSEC managers must analyze the vulnerabilities identified in the previous action and identify possible OPSEC measures to mitigate each one. Second, specific OPSEC measures must be selected for execution based upon a risk assessment done by your company’s senior leadership”²⁹. It is obvious that you cannot avoid from all risks, so “the risks have to be managed to an acceptable level”³⁰. If the operation or mission continue successfully despite a threat or risk, then it would be much better not to create any complications with any measures. The purpose of this step is to select which of the tentative OPSEC measures to implement. The OPSEC PM/officer recommends to the commander the OPSEC measures that he or she believes should be implemented, but the commander responsible for the mission must make this decision. The commander must balance the risk of operational failure against the cost of OPSEC measures.

Consider the following questions for each tentative measure. The OPSEC professionals must be prepared to answer each of these questions:

–What is the likely impact of an OPSEC measure on operational effectiveness, if implemented?

–What is the probable risk to mission success (effectiveness), if the unit does not implement an OPSEC measure?

–What is the probable risk to mission success, if an OPSEC measure does not work?

–What is the impact on future missions if this measure is adopted and successful?

–What is the impact to other units of practicing an OPSEC measure?

Decide which, if any, OPSEC measures to recommend for implementation and when to do so.

Applying Countermeasures can be named as the “action” step. In this final level the best solution is “a combination of low-cost countermeasures that afford the best security”³¹. OPSEC countermeasures emerge of three categories:

–Prevention of adversaries from determining any indicators.

–Using alternative and deceptive appearances of indicators.

–Attacking adversaries’ data collection systems and methods³².

The application process of OPSEC countermeasures “is a continuous cycle that includes evaluating intelligence and counterintelligence reports, public media disclosures, website reviews, integrated systems security monitoring, feedback on reports such as

²⁷ OSPA, *Operations Security, The Operations Security Professional’s Association*, 2009, p. 34.

²⁸ MCWP 3–40.9, *Operations Security (OPSEC)*, Department of the Navy, Washington DC 2009, pp. 3–5.

²⁹ FCC, *Small Biz Cyber Planning Guide, Federal Communications Commission*, p. 2.

³⁰ III CORPS & FH REG 530–1..., p. 32.

³¹ OSPA, *Operations Security, The Operations Security Professional’s Association*, 2009, p. 36.

³² MCWP 3–40.9, *Operations Security (OPSEC)*, Department of the Navy, Washington DC 2009, pp. 3–5.

assessments and surveys”³³. As threats are continuous like a cycle countermeasures need to be the same way to be effective.

Cases and Facts regarding the power of OPSEC or failure with its lack can be understood through several cases from 20th and 21st centuries. Sometimes, tangible facts can be more clear and understandable than theoretical explanations. Let us focus on the cases:

The Battle of Kursk – During World War II German troops attacked to Russian army, as supposing that their number and power are less than their own army. German military authorities underestimated Soviet power because of a deception concept called Maskirovka used by Russian military intelligence. It has actually a common point with OPSEC as its main purpose is protecting the critical information (CI), in this case the huge amount of Russian troops, weapons and armed soldiers. Of course if the German knew that they would not attack at all to Russia. German army did not realize that the actual power of Russians was four times higher than them. The Battle of Kursk (1943) started with the offensive actions of the German. Russia spread among Russian soldier’s rumors what they want to be known as information by the German army and this information is transferred by German counterintelligence. They also hid their important military assets, constructed fake airfields and dummy aircrafts. When these were attacked the German military supposed that they are winning. As a result of Maskirovka (military deception) doctrine Russians were the winner of the Battle of Kursk³⁴. This battle was a critical step and after this Germany became defensive in Eastern front.

Poor OPSEC in Automotive Industry – Volkswagen company was accused in 1993 about “industrial espionage after Jose Ignacio Lopez, the chief of production for GM’s Opel division, left to join the rival German automaker, along with seven other executives. GM claimed its corporate secrets were used at VW. In the end, the companies agreed to one of the largest settlements of its kind: GM would drop its lawsuits in exchange for VW’s pledge to buy \$1 billion of GM parts over seven years. In addition, VW was to pay GM \$100 million”³⁵. The lack of OPSEC principles is the main reason of this scandal.

Sharp Edge of Industrial Espionage – An engineer worked with Gillette company, who was in the team of a new shaver system project, gave confidential information of the company to the competitors in 1997: “Steven Louis Davis, an employee at Wright Industries Inc., a designer of fabrication equipment that was hired by Gillette, faxed or e-mailed drawings of the new razor design to Warner-Lambert, Bic, and American Safety Razor. Davis pled guilty to theft of trade secrets and wire fraud and was sentenced to 27 months in prison. He told the court he stole the information out of anger at his supervisor and fear for his job”³⁶. Gillette’s not applying OPSEC properly gave company a big security trouble. As we can see from the last two examples OPSEC is a necessity for corporate security strategies as well. It should not be considered only a part of national defense. Where there is a critical information to protect there is a place for application of OPSEC model.

WikiLeaks – Australian citizen Julian Assange founded WikiLeaks in 2006 and started to publish classified information of governments. As a philosophical basis he has claimed that they are against authoritarian politics which are in his opinion based on “secrecy” and related conspiracies. So, WikiLeaks started to publish thousands of serious diplomatic documents in

³³ III CORPS & FH REG 530-1..., p. 33

³⁴ J. H. Kantor, 10 Amazing and Successful Military Deception Operations, 2016, <https://listverse.com/2016/06/27/10-amazing-and-successful-military-deception-operations>.

³⁵ <https://www.bloomberg.com/news/photo-essays/2011-09-20/famous-cases-of-corporate-espionage>.

³⁶ Source: <http://www.plstudio.biz/product-rendering/product-closeup-razor.html> (This razor just used as a sample of industrial design, nothing to do with the case).

collaboration with several news agencies and newspapers as well. WikiLeaks has shown that how it can be damaging if critical information cannot be protected properly.

OPSEC in operation desert STORM

DESERT STORM – DESERT STORM demonstrated the effectiveness of the integrated use of OPSEC and deception to shape the beliefs of the adversary commander and achieve surprise. Deception and OPSEC efforts were combined to convince Saddam Hussein of a Coalition intent to conduct the main offensive using ground and amphibious attacks into central Kuwait, and to dismiss real indicators of the true Coalition intent to swing west of the Iraqi defenses in Kuwait and make the main attack into Iraq itself. The OPSEC planning process showed that, prior to initiation of the air offensive, Coalition force and logistic preparations for the ground offensive could not be hidden from Iraqi intelligence collection. The plan then called for conducting the preparations in areas of Saudi Arabia logical for an attack into Kuwait; using the air offensive to blind most of the Iraqi intelligence collectors, and then secretly moving the force to the west where it would be postured for the main ground offensive into Iraq. To support this, deception would create false indicators and OPSEC would alter or hide real indicators, all to help Saddam Hussein conclude the Coalition would attack directly into Kuwait. Deception measures included broadcasting tank noises over loudspeakers and deploying dummy tanks and artillery pieces as well as simulated HQ radio traffic to fake the electronic signatures of old unit locations. OPSEC measures included allowing selected Iraqi intelligence collectors to see aspects of the final Coalition preparations for the real supporting attack into Kuwait and directing aggressive patrolling in this sector. The Marine amphibious force, positioned off the coast, conducted both deception and OPSEC. While USCENTCOM hoped to use them only as a demonstration to keep the Iraqi attention fixed on Kuwait, the Marines were nonetheless a real force that could have been employed if the Iraqis had not bought the Coalition deception.

The Russian invasion of Crimea – The Russian invasion of Crimea in February thru March 2014 was a successful military operation that relied heavily on OPSEC. Careful analysis of the ground situation allowed the Russian military to deploy forces in ways that slowed Ukrainian and NATO realization that an incursion was underway. Russia's large military would have almost certainly been successful against Ukraine using tactics and capabilities demonstrated during the 2008 Five Day War in Georgia. Yet, the Russian leadership chose a different path that involved far less bloodshed. Its use of OPSEC was not only a means to an end but an end itself. Russia reminded the world that their history of warfare relies not only on its strength in numbers, but in its capability to hide its capabilities and intent until they wish for their capabilities and intent to be known. While not formalized as an OPSEC program as the United States knows it Russia has a long history of a similar concept known as maskirovka. Maskirovka is far reaching into information warfare, but its purpose is OPSEC in nature: to confound the adversary's capability to observe, orient, decide, and act (OODA). In this case the Russian Federation's adversaries were primarily Ukraine and NATO followed by Baltic States that are not politically aligned with Russia. The ultimate goal was for Russian military forces to have Crimea firmly in control before their enemies could recognize the threat and martial their military to repulse the invasion force.

Conclusions

We have seen in this article how OPSEC model and its steps are working. The CI (Critical Information) is more important, OPSEC needs to be more advanced and comprehensively conducted. The example cases have given us the opportunity to see how OPSEC principles may be applied in security situations and if it is not used as a protective way how kind of damages and dangers can be confronted.

OPSEC awareness and execution is crucial to Army success. OPSEC is applicable to all personnel, missions, and supporting activities on a daily basis. It applies to all Army activities and is required during training, sustaining, mobilizing, preparing for, and conducting operations, exercises, tests, or activities.

OPSEC contributes directly to the Army's ability to employ forces to gain superiority over an adversary across the full spectrum of operations. Without sensitive and/or critical information about our forces, adversaries cannot design and build systems, devise tactics, train, or otherwise prepare their forces (physically or psychologically) in time to effectively counter the Army's capabilities, activities, and intentions, and exploit the Army's limitations.

OPSEC is everyone's responsibility. Failure to properly implement OPSEC measures can result in serious injury or death to our personnel, damage to weapons systems, equipment and facilities, loss of sensitive technologies, and mission failure. OPSEC is a continuous process and an inherent part of military culture and as such, must be fully integrated into the execution of all Army operations and supporting activities.

What will happen to OPSEC, if it will progress and improve further or replaced by other models and concepts will be seen by the time.

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ARTIFICIAL INTELLIGENCE IN NAVAL OPERATIONS

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Abstract:

The centennial anniversary of the Romanian people brings a secondary connotation in the cyber world environment, the use for the first time of the word robot, by the playwright, novelist and Czech journalist Karel Čapek, the creature presented in the theatrical piece of Rossum's Universal Robots¹. From that moment on, the imagination and technological advancements complete and outline Artificial Intelligence (IA) through incredible advances of technology that have led to extremely sophisticated software development, personal assistants in the smart phone - such as Siri from Apple, Microsoft's Cortana - to advanced autonomous machines that can, in some ways, substitute for human decision-making, with the ability to solve complex problems by reasoning similar to real-world situations. These systems are capable of centralizing vast knowledge, analyzing the environment and responding, responding appropriately and even independently on the battlefield.

The concept outlined in the literature, by which AI will take power and eliminate their creator, has concrete valences by managing information and manipulating them discretely with a well defined purpose to dominate. In the informational age, computational power generates profit, power, and supremacy in the operating area, but especially provides the ability to manage related areas that are no longer related to traditional war laws.

The goal of this article is to highlight the applicability of AI in the maritime domain that goes beyond the traditional use, comparisons due to the uncontrollable dimensions and vast possibilities to cover. Thus, the capability can be found in AI - naval combat management systems and AI - naval autonomous vehicles for strategic, operational and tactical decision making systems.

Keywords: *cyber security; threats; cyber vulnerabilities; artificial intelligence; hybrid war.*

Introduction

Cyber world environment used for the first time the word "robot", by the playwright, novelist and Czech journalist Karel Čapek, the "creature" presented in the theatrical piece of Rossum's Universal Robots. From that moment on, the imagination and technological advancements complete and outline Artificial Intelligence (IA) through incredible advances of technology that have led to extremely sophisticated software development, personal assistants in the smart phone - such as Siri from Apple, Microsoft's Cortana - to advanced autonomous machines that can, in some ways, substitute for human decision-making, with the ability to solve complex problems by reasoning similar to real-world situations. These systems are capable of centralizing vast knowledge, analyzing the environment and responding, responding appropriately and even independently on the battlefield.

The actual evolutions of the science and power computation is increasing rapidly the data requirement and transforming the systems of works. Increased processing power, power

¹ *R.U.R. is a 1920 science fiction play in the Czech language by Karel Čapek. R.U.R. stands for Rosumovi Univerzální Roboti, <https://www.thevintagenews.com/2017/06/02/the-1920-play-r-u-r-the-first-time-that-anyone-heard-the-word-robot/> (accesat la data de 10 Ianuarie 2019).*

of GPUs, availability of huge data management's sets, and advanced algorithms computations are all key reasons we are seeing acceleration in the rate of change in analytics this days. The challenge for the military system is to harness the best of what is happening in the private sector, and apply it to the defense business. It presents organizational, agility, and process challenges. Worst, there are very good reasons to believe other nation states have a head start embracing new ways to looking at analytics. I think the military system and navy in special, recognizes both the threat and the potential in the new progress of the technologies and for the next approach will be marked by experimentation, rapid development, and fielding and filling the gaps of specialized positions. In this environment training and integration will remain major challenges for all of the services and agencies.

The Artificial Intelligence (AI) and Machine Learning are in continuing of developments in order to find their place in the defense and intelligence sectors. One of the keys to success will be constraining the goals of the algorithms to replace the analysts and their works, even we still need to have a human decision in the loop, in order to continually evaluating and quality assuring the output of advanced models and algorithms. Data and its context are continually evolving, and models must be likewise continually monitored, evaluated, and refined to stay effective and efficient.

Minimum requirements for a safety and main methods to determining ship's position for proper navigations push all the tools made for astral and sextant based navigations, for years and years, to the twentieth century invention on board the ships like GPS, Automatic Identification System (AIS), radar and satellite communications. Due to technological evolution process and systems automation on board of ships, the new systems bring automations and recognitions systems used for day by day works but also for complex computers managements systems that work for building safe and secure navigation but also an increasing chance for supremacy on the area of operations.

The ultimate goal for the navy's transporters worldwide is an autonomous vessel operated by autonomous port harbor. Such an unmanned transportation ship is the ultimate stage of technological development for maritime transport branch. This complete system, Naval Artificial Intelligence System, which should include not only the autonomous ship but also the port harbor facilities and navigation systems that support unmanned ships act as a virtual operator of a ship, providing full monitoring and conducting all sorts of automatic services, commencing with ensuring safety of the object and cargo.

Artificial Intelligence. Overview

The onset of Artificial Intelligence (IA) occurred in the 1950². Researchers addressed this issue of IA from two perspectives:

- from a symbolic perspective – making a mind –, aiming to equip rational mechanisms with the ability to use symbolic data, which constitutes knowledge in a certain field. This perspective calls for models and methods of logic, especially mathematical logic. The result was the generation of knowledge-based systems;

- from the perspective of the IA connection – Modeling the brain – inspired by the way the cerebral cortex works, aiming at the copying and simulate the human brain. The formal model of the neuron is the basic entity that is formed by the interconnection of a large number of "neurons".

This model is the basis of the current neuro-mimetic networks.

After 1990, there was a tendency to design hybrid models by combining the two types of approach that have complementary characters. They have resulted three types of

² Text presented by Jean-Paul Haton at the 263th Conference at the Université de Tous les Savoirs Donnée, September 9, 2000.

approaches to the IA issue and its actual realization have emerged: symbolic, connection and statistically.

Using effective learning methods allows an animal or a mechanism to acquire knowledge and develop it. Therefore, designing effective learning methods and adapting them to the new conditions created by technical progress and, in particular, the knowledge society, is another very important area in the dynamics and development of IA.

Within the methodological areas of development of the IA, the following can also be included:

- knowledge management and symbolic reasoning;
- recognition and interpretation of data;
- support the decision;
- action planning and robotics;
- the treatment of written and spoken natural language.

AI procedures and evolution

IA has a multidisciplinary character. This is found at the origin of the different modes of representation. The sources of inspiration are alike computer science and logic, as well as cognitive psychology. The right choice is according to the problem need to be solved, the level of the control over the reasoning and the type of problem that will be taken into consideration to be solved (evaluate, diagnose, plan, etc.). IA has the capacity to connect, several modes of representation, in the same system, so as not to affect diversity but to create the whole, the action, the flow and the process.

Another important current of research is focused on distributed IA. The idea comes from the 1970s based on actors' languages and the blackboard model. It is the interaction of several agents (an agent being a material entity, such as a robot or software), to solve a number of problems that cannot be solved by each agent.

Neuro mimetics models are models of neurobiological inspiration (of course not so complex, even rudimentary with in relation to the human brain). At present, the most widely used processor is the formal neuron proposed by McCulloch and Pitts (Figure 1). It is a rudimentary neuron model, the synapse activity being provided by a kind of weighted stimulation.

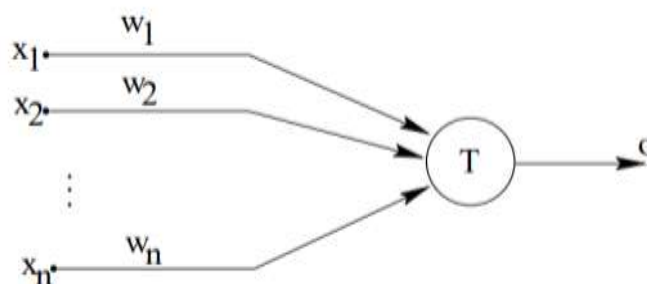


Figure 1. The formal neuron of McCulloch and Pitts

Source: Jean-Paul Haton, 263th University Conference of All Knowledge, September 9, 2000

The interconnection of such units has the effect of generating a neuro-mimetic connection system, namely a neural system. This system has a number of very interesting properties, the most important of these - which, in fact, defines it - the ability to learn by example.

There are many architectures of this model: stratified networks, self-organizing cards, recurring networks, etc.

The figure below, Figure no. 2, shows a multilayer perceptron that is used, for example, in model recognition applications, recognition and digitization of handwriting.

Recognizing the model and using it or identifying important structures of a system and functions of the system or process and, in our case, identifying weapon systems or networks are widely used today, becoming one of the fundamental characteristics of military action in the the battle space.

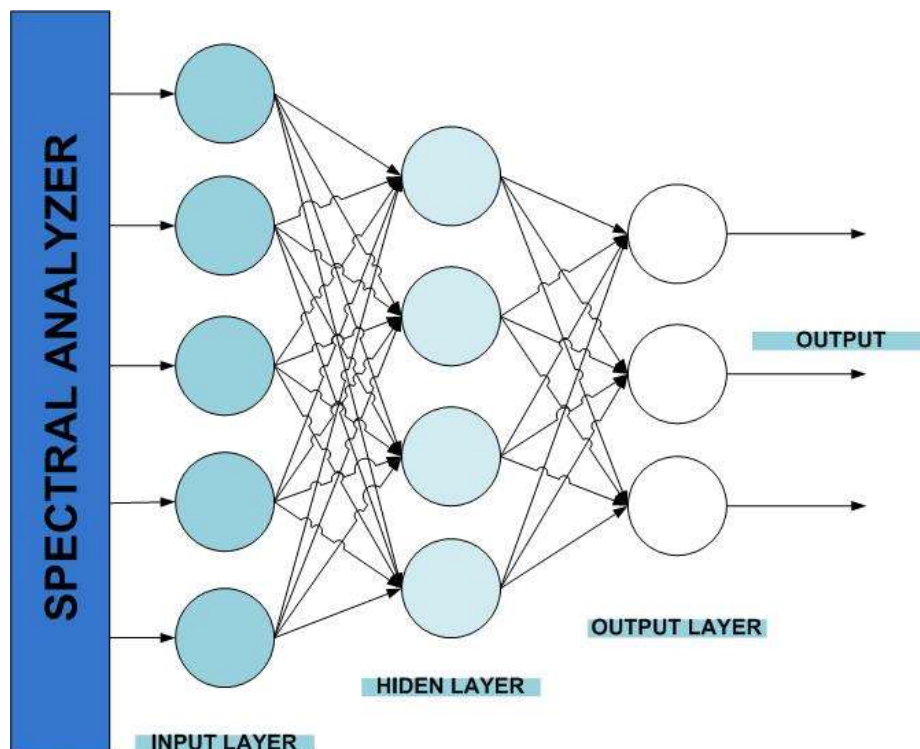


Figure 2 The architecture of a perceptron with a hidden layer

Source: Jean-Paul Haton, 263th University Conference of All Knowledge, September 9, 2000

In neural networks, progressive learning is built on connections between neurons. These connections, depending on the network model, take place according to two types of laws:

- a biological or psychological law, according to which there is a consolidation of the connection power between two simultaneously excited neurons (Hebb's law);
- a mathematical law based on a method of optimizing a cost function related to the network error (backpropagation of the gradient error used in layered networks).

It's about the ability to learn from examples. This allows neural networks to approximate a function, even one nonlinear. These networks also have a generalization capacity (treating a case, recognizing a form, even under conditions different from those of learning), which is part of the thinking operations.

These properties have been used in many applications: data classification; model recognition (using rational recognition algorithms, optical character reading, biological signal characterization, speech recognition); the approximation of functions in experimental set sets; weather; predictions; optimization; accessing information from the incomplete description, etc.

Of course, inspiration of neurobiological nature (from neural networks) has its limits. The formal neuron is extremely simple compared to the real neuron, but further efforts are being made to develop models of neural and neuro-mimetic architectures closer to biological reality, for example the cortical column model.

Twist the chances on the Navy Operations

The Panoply of the Mars Was Deity is expanding with the expansion of the war in places that were not accessible to them in the past. Indeed, the very definition of the term of War once given by Clausewitz – that war is said to be a continuation or, more precisely, to the

operation of politics by violent means, that is, by the force of arms, by battles between two or more armies – require serious updates even if its essence is not lost.

The current concern for Artificial Intelligence (IA) defines as a critical component of military operations in a modern warfare. In a comparison with a conventional system, AI-equipped naval platforms are able to manage an impressive volume of data, more efficiently, resulting in increased efficiency for deducted tasks. Moreover, AI improves data management, self-control, system self-regulation and automatic action of battlefields due to inherent computing and decision-making capabilities. The AI is present and deployed in more and more military platform application and research and development on this field is growing according with increased funding from military AI systems research developed and integrated in new and advanced military applications with advanced artificial intelligence projected. All this are driving to increased implementations of AI-driven systems in the military platform and the best performances and facile implementation are navy platforms.

Artificial Intelligence (AI) and connected capabilities that can build and sustain the battle space with software application in naval operations and interconnect naval platforms are already drowned and planed and other are already implemented. The contribution of AI in naval operations are present and will be more present on all five military domains, land, air, sea, space and cyber. Because the sea domain involve for the battle space the water field, the underwater space that are completed by the air space domain, we are interested in the AI connections with the navy platforms, systems and water/underwater vehicles. These platforms theoretically can never be replaced by the human decision. The naval operations command and traditional naval platforms, is suppose to be replaced by the AI intelligent systems that can be deployed online and updated by connections in order to fulfill the mission. This future innovation in computation technologies will lead to completely AI autonomous platforms with lethal capabilities, with real ethical issues.

For instance, the US Department of Defense's (DoD) Defense Advanced Research Projects Agency (DARPA) is financing the development of a robotic submarine system, which is expected to be employed in applications ranging from detection of underwater mines to engagement in anti-submarine operations. Additionally, the US DoD overall spent USD 7.4 billion on artificial intelligence, Big Data, and cloud in the fiscal year 2017, while China is betting on AI to enhance its defense capabilities and is expected to become the world leader in this field by 2030³.

An analysis by Markets and Markets indicates that the market size of artificial intelligence in military is expected to reach USD 18.82 billion by 2025, at a CAGR of 14.75% from 2017 to 2025. Here are eight major military applications where AI will prove its importance in the years to come⁴.

Situational Awareness for Naval Operations

Situational awareness and monitoring of operation battle space are directly based on C4ISR components, Intelligence, Surveillance, and Reconnaissance (ISR) systems and operations. The ISR systems are based on the comparisons of known behaviors and operations fulfilled already and are mainly used to acquire and process information to support a range of military activities and decisions. Unmanned naval platforms used to carry out ISR missions are more and more based on AI, either are remotely operated or sent on a prior-defined route. Equipping these systems with AI assists defense personnel in threat monitoring, thereby enhancing their situational awareness.

³ <https://www.darpa.mil/> (accesat la 11 ianuarie 2019).

⁴ <https://www.marketsandmarkets.com/> (accesat la 11 ianuarie 2019).

Unmanned aerial/underwater vehicles (UAVs/UWVs) – also known as drones – with integrated AI can patrol large areas, identify potential threats, and transmit automatically information about these threats to response teams. Using UVs can thus strengthen the security of military bases, as well as increase the safety, efficiency and effectiveness of military personnel in battle or at remote locations.

Management of Warfare

Starting with Combat Management Systems (CMS) and UAVs platforms the Defense program planned and developed by different countries across the globe are embedding AI, with grate results, into weapons and other command and control systems used on all platforms, land, naval, airborne, and more over space, but the most interested and successful domain is cyber domain. The cyber domain is also combined in all land, naval, and air platforms due to network connectivity and networks features in support for the CMSs.

Implementing and using AI in CMS based on these military platforms has enabled a new dimension to develop of efficient warfare systems, which are less reliant on human input, less human loss probability and more easier to autocorrect on already deployed operations and of course high speed and fast computations. It has also conduct to increased synergy and enhanced performance of warfare systems while requiring less maintenance and less human interaction. AI will empower and setup the autonomous and high-speed platforms and weapons to carry out collaborative attacks and auto-control.

The next step of AI implementation on warfare space is the alternative of the A2/AD based on technology that made it easier and cheaper for countries to employ the ISR capabilities necessary to conduct A2/AD operations, but, this will be the next step the countermeasure for actions against the A2/AD systems. This will act to identifies and define the systems component and act against the systems before they can act in order to turn down this A2/AD, who uses “a series of interrelated missile, sensor, guidance, and other technologies designed to deny freedom of movement. This is possible because of the power of computation and concept for reversed engineering applied on the concept plans with support of the learning machine setup with history actions.

This military action are possible on the cyber systems, systems often vulnerable to cyber attacks, which can lead to loss of classified military information and damage to military systems. However, systems equipped with AI can autonomously protect networks, computers, programs, and data from any kind of unauthorized access and act against the identified enemy. In addition, AI-enabled web security systems can record the pattern of cyber attacks and develop counter-attack tools to tackle them.

Logistics

AI can play a crucial role in military logistics. The effective supply and transportation of goods, ammunition, armaments, and troops is an essential component of successful military operations. The goal of supply whatever you need to wherever you need and whenever you need can be fulfill with AI that can synchronize the request, data bases and the supplier chain according with a automated systems design to load and send the items. Recently, the US Army collaborated with IBM to use its Watson artificial intelligence platform to help pre-identify maintenance problems in Stryker combat vehicles⁵.

Target Recognition and targeting procedures

AI techniques are being developed to enhance the accuracy of target recognition in complex combat environments. These techniques allow defense forces to gain an in-depth

⁵ AI helps Army with Stryker *maintenance*, BY SARA FRIEDMANAUG, <https://defensesystems.com/articles/2017/08/08/army-stryker.aspx>

understanding of potential operation areas by analyzing reports, documents, news feeds, and other forms of unstructured information. Additionally, AI in target recognition systems improves the ability of these systems to identify the position of their targets. Capabilities of AI-enabled target recognition systems include probability-based forecasts of enemy behavior, aggregation of weather and environmental conditions, anticipation and flagging of potential supply line bottlenecks or vulnerabilities, assessments of mission approaches, and suggested mitigation strategies. Machine learning is also used to learn, track, and discover targets from the data obtained.

For example, DARPA's Target Recognition and Adaptation in Contested Environments (TRACE) program uses machine learning techniques to automatically locate and identify targets with the help of Synthetic-Aperture Radar (SAR) images⁶.

Combat Simulation&Training

Simulation&training is a multidisciplinary field that pairs system engineering, software engineering, and computer science to construct computerized models that acquaint soldiers with the various combat systems deployed during military operations. The US is investing increasingly in the simulation & training applications. The AI can power these systems in order to analyze the procedures and act only according with the defined enemy. In this way the soldiers are trained on the near real, non lethal, combat field. Of course we can manage and redefine and let the AI learn and build a harder war game, but finally the goal is a close-to-real training, not breaking down the soldiers.

Conclusion

The application of AI on Naval Operation beginning prior to deployment of the crew and ship and is finishing later after the platform has finished the mission with the after action report. The AI can manage the training, the preparation of the crew and the ship conducting near real training and a complete check of the platform systems. Of course man can be in the loop as long as the output of the AI system is easy to read by the users. As days go by, the AI has become more and more involved in the system control and the possibility to choose a course of action build in a second by the system, a system that can compute a lot of information and procedures. However, the next step of AI is to act against AD/A2 systems because the AD/A2 is based on the same technology and is easy to turn against the control AD/A2 system and the vectors of the system. This way the goal is to defeat the enemy before the fight.

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THOUGHTS CONCERNING CIVIL-MILITARY COOPERATION AND DEVELOPMENT TRENDS IN TODAY'S SECURITY ENVIRONMENT

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Abstract: *Civil-military cooperation is the multifaceted integrated function of military operation which gathers all cooperating parties and facilitates mutual civil-military support, in order to reach the mission state necessary to obtain the best results through collaboration between the local population, civilian and military actors. Through coordination and synchronization of military activities with civilian actors, civil-military cooperation brings political objectives in the military operations to achieve the desired end state. This article tries to approach a comparative analysis and present the image of civil-military cooperation described by the various national doctrines, how the capabilities are developed and to identify the most significant differences and similarities between countries.*

Keywords: *civil-military co-operation; multinational operations; NATO; doctrine.*

Introduction

Civil-Military Cooperation (CIMIC) is a NATO concept that was used initially during peace support operations and gained popularity since 2000. If civil-military relations are established at strategic levels and express overall political and military matters, civil-military cooperation is a military concept that reflects a segment of relations, namely the collaboration of multinational military forces with public authorities, civil society organizations and the civilian population in order to achieve common goals.

Civil-military cooperation (CIMIC) is a joint function comprising a set of capabilities integral to supporting the achievement of mission objectives and enabling NATO commands to participate effectively in a broad spectrum of civil-military interaction with diverse non-military actors¹.

The development of civil-military cooperation concept in NATO

In the early 1990s, the evolution of the concept of civil-military cooperation in NATO witnessed a transformation regarding its purpose. Typically, military forces were reluctant at first to take into account civilian factors for their missions. Therefore, the NATO member states held discussions about the crucial issue if the multinational forces should remain only military tasks "ordinary" or exceed conventional "border" military operations to engage also in complex and seemingly endless public processes in the area.

The lessons learned from NATO's operations shows that crisis management requires a comprehensive approach that combines political, civilian and military instruments. Relying on its unique capabilities and operational experience, including expertise in civil-military interaction, NATO contributes to the international community's efforts to maintain peace,

¹ AJP-3.19, *ALLIED JOINT DOCTRINE FOR CIVIL-MILITARY COOPERATION*, Edition A, Version 1, November 2018, p. 2-1.

security and stability, in full coordination with other actors. Military resources, although essential, are not sufficient to face many complex challenges to our security. Effective implementation of a comprehensive approach of crisis situations requires the nations, international organizations and NGOs to contribute in a concerted effort.

Gradually, both the concept itself and the activities of civil-military cooperation, gained new possibilities and directions, reaching an integral part of military activities and therefore peace support operations, incorporating the support given to military governments or local authorities, or theater of operations. Military operations are taking place now in a much larger and more complex political and military framework, the influences (from physical to economic and social) being able to lead to a crisis or may arise as a result in conflicts in regions which did not previously exist. From that complexity stems the comprehensive and diversified role of CIMIC missions and heterogeneous skills that CIMIC personnel in this structure must possess, most of which are learned not by training or in specialized courses, but gained in time.

From the perspective of a holistic approach, according to NATO, civil-military cooperation is the anchor of the civilians that ensure coordination, synchronization and reconciliation between the activities of military and civilian actors, so that military forces can fulfill the ultimate goal. In order to harmonize the contribution of NATO forces and civilian actors operating in a theater of operations, it is necessary to develop effective relationships between them, thus contributing to the achievement of a comprehensive approach.

Therefore, the Alliance will actively encourage collaborative analysis, planning and the conduct of military operations. This will allow to maximize the effectiveness and coherence of missions. Thus, to increase the effectiveness of crisis management NATO will strengthen civil-military integrated planning (...); to develop the capability to train and develop local forces in crisis zones, so that local authorities are able, as quickly as possible, to maintain security without international assistance; identify and train civilian specialists from member states, made available for rapid deployment by Allies for selected missions, able to work alongside our military personnel and civilian specialists from partner countries and institutions; broaden and intensify the political consultations among Allies, and with partners, both on a regular basis and in dealing with all stages of a crisis – before, during and after".²

Former Secretary General Jaap de Hoop Scheffer said in 2007 that a comprehensive approach must promote "cooperation and coordination between international organizations, individual states, agencies and NGOs, as well as the private sector"³.

Civil-military cooperation in the armies of other allied countries

With the end of the Cold War and the initiating of new types of military operations, many countries have begun to develop structures that can conduct civil-military cooperation and implement their understanding of the concept of most European countries, according to NATO CIMIC doctrine.

For the purpose of the US, civil-military operations⁴ are based on a more complex definition, generated by international experience, the positive and negative results obtained from the structures performing civil-military operations / CMO in theaters. In other words, the American definition details the types of relationships that can occur between the military forces deployed in theaters and Indigenous Populations and Institutions (IPI) in relation to the

² *Active Engagement, Modern Defence*, Strategic Concept for the Defence and Security of the Members of the North Atlantic Treaty Organisation adopted by Heads of State and Government in Lisbon, 2010, art. 25.

³ Speech by NATO Secretary General, *Conference examines role of private sector, media in "comprehensive approach" to security*, in Noordwijk aan Zee, the Netherlands, on 23 April 2007, <https://www.nato.int/docu/update/2007/04-april/e0423a.html>, accessed 2 November 2018.

⁴ Joint Publication 3-57, *Civil-Military Operations (CMO)*, 2018.

actions or their effects of the American power (military and non-military) to achieve their objectives. This detailed definition opens a preliminary framework of legal doctrine in which CMO links are specified with the levels at which military operations, CMO components and actions in relation to a specific element of American projection, civil affairs (CA) and civil affairs operations (CAO): "the civil-military operations (CMO) are activities of a commander carried out by designated civil affairs or other military forces which establish, maintain, influence, or exploit relations between military forces and the people and institutions of indigenous by supporting direct realization of the objectives of the restoration or maintenance of stability in a region or host nation (HN)"⁵.

Another NATO member with an important role in the current security architecture, UK, uses as own doctrine AJP-3.4.9 Allied Joint Doctrine for Civil-Military Cooperation, which became in the British doctrine nomenclature Joint Doctrine Publication 3-90, document approved by the Ministry of defense of the United Kingdom in accordance with the alignment projection, maximum consistency and interoperability within NATO, as shown in the statement of the chief of defense: "... in July 2012, chief of defense and the permanent sub secretary issued a clear direction on how the British contribution to NATO could be further improved, saying that we should use NATO doctrine whenever we can, and to ensure consistency doctrine with the NATO whenever we cannot." Differences in perception from NATO document are minor and are clearly marked in the text of the British doctrine.

Regarding France, the "coopération civilo-militaire" is in line with NATO projection and is very clear about the kinds of desired ends: achieving military missions, restoring a normal military situation, crisis management, etc. through and with the help civil authorities of the host country, "civil-military cooperation is an operational function designed to improve the integration of the armed forces in the civilian theater of operations. This facilitates achieving military missions, restoring a normal security situation and takes into account crisis management by local authorities. The main CIMIC objectives are therefore force support and the civil and humanitarian environment"⁶.

The French vision bases its projection global nature of the current crisis and discusses the need for collaboration in theaters of operations between the multinational forces and the local population, local authorities, international organizations, nongovernmental organizations, etc. in order to facilitate operations to end political and military crisis. But unlike other doctrinal tools in which CIMIC functions are restricted and limited to this concept, in the military French doctrine there are three concepts involving a similar interpretation: civil-military cooperation, civil-military relations and civil-military affairs.

The first aims to facilitate building its forces and allied activities, including checks of refugees, information gatherings among the civil population, etc. Civil-military affairs translate the dialogue between representatives of military institutions and structures, services or institutions which play a role in the return to normality of the host nation. Civil-military relations aim to notify military forces to facilitate their mission in theaters. The first two concepts resulting from the structure called "civilian-militaires actions" (ACM) from 2000s doctrines are equivalent to civil-military cooperation, while last phrase pursues activities that are distinct structures of public relations.

As with most CIMIC doctrines from other countries, the Canadian doctrine is also constantly changing and adapting, in correspondence with the latest lessons learned and the new types of conflicts and thus the reality with which these forces collided recently. In Canadian doctrine the expression of civil-military cooperation is described "as a military

⁵ *Ibidem*, p. GL-6.

⁶ Etat-Major des Armees (EMA), *Concept et Doctrine Interarmees de la Cooperation Civilo-Militaire*, Paris, 2012, p. 8.

function that supports the mission commander, establishing and maintaining coordination and cooperation between the military and civilian actors in the commander's operation area."⁷

The doctrine of the Canadian Forces, the expression of civil-military cooperation activities, is shaped as a function that supports the mission commander and is implemented "by maintaining coordination and cooperation between the military and civilian actors in the commander's operation area"⁸. Civil-military cooperation activities are similar to those stipulated in the American system, being formulated as those means by which armed forces perform their basic CIMIC functions. Thus, these include: "(...) relations to civilian actors; civil environmental assessment; advising the commander and staff to the issues on the civil side, shortcomings and requirements; and, in some cases, facilitating projects in response to local needs and fostering good intentions".⁹

Being among the NATO countries, Canada will also follow the principles CIMIC NATO Doctrine, through activities such as: contact with public entities, civil environmental assessment, advising the commander and staff, on the conditions, difficulties and civil requirements, facilitating projects that address the needs of civilians and the promotion of good intentions.

As with other countries, Germany has developed its own concept of civil-military cooperation called German Zivil-Militrische Zusammenarbeit / ZMZ, which focuses on both the deployment within the country in an emergency, as well as external development within multinational and humanitarian operations.¹⁰

The doctrine of German civil-military cooperation is described as providing CIMIC forces CIMIC missions, who create / maintain CIMIC database projects, providing CIMIC personnel key and durable structure that prepares, implements and trains CIMIC forces for mission, CIMIC training and training specialists. However, German doctrine emphasizes the CIMIC contribution missions related to civil activities (country studies), support for all training activities and conduct of national and international CIMIC exercises, CIMIC future development – vision¹¹.

The Czech edited entirely the doctrine modeled on NATO CIMIC. This doctrine provides the necessary coordination to support planning and conduct of military capabilities CIMIC Czech operational at different levels of ambition (as in Belgium), which are determined at political-strategic level and Czech army under the strict doctrine.

In Belgium, CIMIC doctrine is based on the NATO's respectively AJP-9 is completed and adapted "with CIMIC capacity utilization in the different Belgian operational levels of ambition decided political-strategic"¹².

Hungary started to develop its capabilities on civil-military cooperation after they joined NATO in 1999 and the first elements of civil-military cooperation were employed in operations since 2000. Hungarian CIMIC doctrine is based on NATO doctrine and civil-military; however, it is not considered to be a capability; that is why it is used in operations along with psychological operations (PsyOps) and the information operations (InfoOps).

Holland also aligns the same doctrines above using similar elements, "CIMIC supports military mission through coordination and cooperation between various military commanders

⁷ Interallied Confederation of Reserve Officers / CIOR. *CIMIC Capabilities. An overview of doctrines, structures and courses in selected NATO member countries. Results of CIMIC study.* Norvegia, Oslo, 2010, p. 11.

⁸ *Ibidem*, p. 8.

⁹ *Idem*.

¹⁰ German Armed Forces, *Teilkonzeption Zivil-Militrische Zusammenarbeit der Bundeswehr*.

¹¹ Interallied Confederation of Reserve Officers / CIOR. *CIMIC Capabilities. An overview of doctrines, structures and courses in selected NATO member countries. Results of CIMIC study.* Norvegia, Oslo, July 2010, p. 23.

¹² Stijn van Weezel, Civil-Military Co-operation Centre of Excellence, *CIMIC Concepts & Capabilities. Research into the CIMIC Operationalisation of Nations.* Olanda, Enschede, 2011, p. 8.

and civilian actors, including local and national authorities and organizations, international and nongovernmental organizations. CIMIC provides to the supreme commander the ability to carry out long-term goals and objectives" ¹³.

In Switzerland, a country whose neutrality is widely known in Europe and beyond, carrying out missions, including those of civil-military cooperation is achieved with joint and combined forces. Thus, the "crisis management and support in case of disaster in CIMIC are by federal law – considered tasks for Militia and Defense Forces of the national territory in order to carry out internal and external successful operations and participate in support of humanitarian operations worldwide"¹⁴.

The Switzerland CIMIC doctrine is based on a slightly different structure, controlled command, which considers: (1) leadership, protection, rescue, logistics support in case of disaster and natural disasters and (2) "equivalent measures in the field of CIMIC operations during armed conflict, such as, but not limited to, hostile military operations, asymmetric warfare and / or terror." ¹⁵

NATO CIMIC Structure

To meet the needs of civil-military cooperation increasing and harmonizing concepts for the preparation of forces and means to participate in mission in theaters, NATO established in the early 2000s two multinational CIMIC structure deployable, regiment level. Thus, in 2001 in Enschede/Netherlands CIMIC Group "North" came into being, being supported by the following countries: Czech Republic, Denmark, Germany, the Netherlands, Norway and Poland. The main objective of this institution was to be a multinational structure able to participate in international operations. Since 2005, CIMIC Group "North" became the Center of Excellence in CIMIC (CCOE), and in 2014 it was moved to The Hague / Netherlands. CCOE is not part of the NATO command structure, but takes part in the command through training, advice and education through conceptual and doctrinal development, and contributing to the lessons learned. Currently CCOE is sponsored by Denmark, Germany, Hungary, Latvia, Netherlands, Poland and Slovenia.

In 2002, at Motta di Livenza/Italy, the multinational group "South" was created by joining the multinational structure of the following countries: Greece, Hungary, Italy and Portugal. The first operational commitment of this structure began on June 29, 2003, with CIMIC Center staff involved in the operation "of ancient Babylon" in Iraq. By 2006, eight units of CIMIC structures took part in this mission. Also, we could remember another circumstance, namely that on 26 February 2004 was signed in the presence of a representative of SHAPE¹⁶, the Memorandum of Understanding (MoU) between representatives of Member Italy, Greece, Portugal, Hungary and Romania. This agreement sets out the tasks of the unit, both in operations and combat type in the peacekeeping. Since April 28, 2009, the Group CIMIC "South" turned into Group CIMIC Multinational (MNCG) and the only operational capabilities CIMIC within NATO, intended to carry out CIMIC in support of multinational forces during operations of the Joint Force Command to multinational brigade level. However, this structure provides expertise and advice on issues related to civil-military cooperation. Currently, Member States are Greece, Hungary, Italy, Portugal and Romania (affiliated to this organization in 2009).

¹³ Interallied Confederation of Reserve Officers , *op.cit.*, p. 25.

¹⁴ *CIMIC Capabilities. An overview of doctrines, structures and courses in selected NATO member countries. Results of CIMIC study.* Norway, Oslo, 2010, p. 54.

¹⁵ *Ibidem*, p. 55.

¹⁶ *Supreme Headquarters Allied Powers Europe (SHAPE)* is the headquarters of the North Atlantic Treaty Organization's Allied Command Operations. SHAPE is located at Casteau, north of the Belgian city of Mons.

Multinational CIMIC Groups have been operationalized to act as a bridge between NATO forces and civilian agencies, governmental and non-governmental organizations and the local population in a theater of operations. The two CIMIC Groups subordinated to the Supreme Allied Commander Europe have multinational command structure, national support units and functional specialists. In peacetime, they are centers for training, education, and consultation offering permanent expertise in civil-military cooperation. Moreover, the two multinational bodies organize multilateral meetings and debates being in permanent contact with the main national and international governmental and non-governmental organizations.

Under the CIMIC directive at strategic level every NATO member state developed its own capabilities in the area of civil-military cooperation by creating CIMIC support teams with the task of providing support to division and brigade commanders in cooperation and collaboration with civil partners from tactical level. States which contribute forces to the multinational groups bear responsibility for organizing and equipping their staff. Units and functional specialists will remain in the countries of origin in the units where they work for peace.

Development

In November 2018, NATO approved the new doctrine draft on civil-military cooperation and certainly this new doctrine will have a considerable influence on national CIMIC doctrine and also on the development of their capabilities. First we consider that the new doctrine will make the transition from the concept of civil-military cooperation to the CIMIC size capability, and second the tactical tool needed for civil-military interactions will be necessary for contributing to a comprehensive approach.

In the future, the efficiency of civil-military cooperation will lead to reduced costs in military operations by improving response capacity in order to meet the challenges of the ever-changing security environment. In this context, civil-military cooperation in the Alliance will arise as the relationship with the civilians, the key facilitator for military contribution to a comprehensive approach.

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HIGHLIGHTS UPON CIVIL-MILITARY COOPERATION EVOLUTION IN MULTINATIONAL OPERATIONS

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***Abstract:** Civil-military cooperation is not a new phenomenon in the theory of war, but in recent decades it has become increasingly dominant for multinational military operations efficiency by transforming it into an important tool for military commanders. Today, civil-military cooperation, as military function, is an integrated part of multidimensional modern operations which analyzes all parties interacting in conflict and facilitates the mutual assistance of civilian capabilities of the multinational forces and vice versa. The aim of the article is to analyze the emergence and development of civil-military cooperation.*

***Keywords:** civil-military co-operation; civil-military relations; multinational operations; NATO.*

Introduction

Civil-military cooperation is a new concept used to describe the activities and relations between the multinational forces and civilian actors. This concept has arisen and is used due to major problems of the environment under which the multinational military operations are carried. The large number of civilians, multinational military forces and humanitarian organizations present in a theater of operations, work together to meet environmental challenges, resolving a comprehensive variety of topics. There are different situations when multinational forces must fulfill tasks that are not purely military. This puts an even greater emphasis on civil-military relations. This interaction process referred in NATO as abbreviation CIMIC (civil-military cooperation).

The emergence and development of civil-military cooperation

Civil-military cooperation is as old as peace and war. There is little historical script proof regarding military forces interaction with civilians. In Julius Caesar’s Gallic wars, political and military spheres united in a civil-military government, as in ancient Persia, India and China. One thing that should be emphasized is that the war expresses above all a political action.

Armed conflicts in fact, have always had undeniable impact on civilians’ lives. Soldiers always went into action in civil territories, often with devastating effects on the latter, while fighting the people who lived in them. Sometimes, these soldiers were seeking shelter or supplies. On other occasions, they need health care to treat their wounded. They interacted with civilians to purchase new equipment or to gather intelligence, sometimes even by catching them in the crossfire. While the interaction between civilians and military phenomenon is as old as human history, its decisive purpose is a modern violation of Latin principle “al bellum se ipsum alit” (war feeds itself).

As violent conflicts have always fed from and on civilians’ backs, this arrangement was maintained over the centuries. In literature, this principle was first presented in Livy’s History of Rome, which was originally published between 59 BC and 17 AD. The phrase was attributed to a Roman statesman, which during the conquest of the Iberian Peninsula in 195

BC refused to spend more money for additional resources necessary for his troops. Instead, he ordered soldiers to source, first by extracting resources from land they have occupied.

During the Thirty Years' War (1618-1648), this practice gained new importance when the imperial military commander Albrecht von Wallenstein began to systematically exploit occupied territory. Finally, his soldiers were paid and fed entirely from war plunder. So convenient and advantageous was it that other armies rapidly adopted Von Wallenstein example of using military force for collecting contributions in the occupied territories.

This way, "war feeds on itself" became an effective method to sustain a prolonged armed conflict. Armies ruined environments everywhere by extracting resources, goods, services and new recruits to maintain combat capability. Local authorities, in turn, were forced to cooperate with them without much choice or to comply. Civilian environmental devastation increased suffering among civilian population, hindering effective reconstruction efforts during conflict over decades.

As the war became more deadly on a large scale, in the mid nineteenth century, they formed organizations such as the International Committee of the Red Cross (1863), to deal with wounded warriors and the impact of the battle on the civilian population. World War One was the last major conflict in which most of the victims were military. The Second World War was the first conflict in which most of those who suffered were civilians. Since then, most victims of conflicts, both large and small, were civilians. The cultural aspect became an important element in war because war itself changed.

Currently, the share of military versus civilian victims is 80% to 20%, while in the previous era of the two world wars, this ratio was reversed. War is a combination of state and non-state actors that are often organized in very free horizontal networks, rather than hierarchical military organization. Today, an important role in ensuring the effectiveness of multinational forces action in theater and creating the sense that military to acts in accordance with the legal provisions is playing by "rules of engagement" (ROE). These are directives from political and military authority, to structures involved in post-conflict military operation that specify the circumstances and limits within which they may initiate or continue warfare with the opposing forces¹.

During the period after the Second World War, military planning tended to ignore the civil aspect of military operations: it was simply not taken into account. Trough defensive plan for Central Europe, NATO considered the deployment and movement of millions of soldiers with tens of thousands of pieces of military equipment of all sizes, completely ignored the existence of millions of civilians in the midst of conflict. Military planning involved a widespread evacuation of large parts of a population, ignoring the possibility of millions of refugees, the outbreak of a generalized panic or complete breakdown of civil infrastructure.

The evolution of civil-military cooperation in NATO

Civil-military cooperation is not a new phenomenon in multinational operations, one of the best examples being the statement of General DD Eisenhower, commander of all Allied forces in Europe in 1944 "The faster I solve the problems that go beyond the military sphere, the happier I will be! Sometimes I think I live 10 years every week, of which at least 9 are absorbed in political and economic problems ... and how much headache ... insufficient water resources, power shortage, lack of food, lack of fuel and bodies scattered all over the city ... ²"

After the Cold War, the development and consolidation of democratic civil-military relations was made by harmonizing the contribution completed by the armed forces and civil society organizations working in the areas of operations of the civilian population, which led

¹ Colectiv de autori, *Doctrina pentru operațiile întrunite multinaționale*, București, 2001, p. 83.

² Eisenhower Dwight, *Cruciadă în Europa*, Editura Politică, București, 1975, p. 14.

to the development of effective relationships between them. The new system of relations between civilians and the military has gradually emerged and began to develop a special focus on cooperation in creating an environment propitious for preparing and conducting military operations. Moreover, from the need to reduce hostility in the environment where operations are carried out, drifts and is widely recognized the name of civil-military cooperation. Its aim is to create a favorable environment for the mission and "win hearts and minds" in military operations³.

Origins institutionalizing the concept of civil-military cooperation in NATO are strictly related to international status of the 1990s, when the Balkan wars led to a new understanding of the operational environment. The role of military forces during an operation in the Balkans environment did not take into account civil-military interaction. The analysis of the civilian matters was largely limited to military intelligence. However, due to the asymmetry of the conflict, the interaction between the multinational forces and the local population became inevitable. Today, NATO's operations are conducted in an environment where "people on the streets, houses and fields - all people everywhere - are a battlefield"⁴.

Another factor that influenced the development of the concept of civil-military cooperation within NATO was the growing number and importance of civil actors working in the field. Thus, with the deployment of the Multinational Force in Kosovo (KFOR) in 1999, about 500 organizations began working in theater. Coordinating the activities of these organizations was a large challenge for the military administration. After signing the peace agreement, some international civilian agencies had the responsibility for key areas of post-conflict reconstruction, such as monitoring government agencies and local police, humanitarian assistance and support in organizing the electoral process. After the Balkan wars, NATO noted that the objectives of the armed forces are not reduced to leading to a ceasefire and maintaining peace, their task should also include assistance mission and support the delivery of humanitarian aid and reconstruction of infrastructure and civil institutions.

Civil-military cooperation is used in all NATO operations. All commanders must evaluate and analyze the civilian environment and to apply in planning and conducting military operations in terms of themes all scenarios. These considerations include assessing a large number of non-military actors present in the area of operations. Application and civil-military profile cooperation depends on the type of operation, the civilians and the relationship with non-military actors⁵. Therefore, there is a need for a mechanism to enable and facilitate a framework for cooperation between multinational military forces and civilian actors with different profiles and mandates. To achieve better coordination of actions in the area of operations, NATO initiated the institutionalization process of approach to civil-military cooperation.

Thus, changes in operating environment led to the development of a new NATO Strategic Concept in 1999. According to its provisions "interaction between Alliance forces and the civil environment (both governmental and non-governmental) in which they operate is crucial to the success of operations. Civil-military cooperation is interdependent: military means are increasingly requested to assist civil authorities; at the same time, civilian support to military operations is important for logistics, communications, healthcare and public affairs. Therefore, cooperation between military authorities and the Alliance will remain essential⁶.

Therefore, the Strategic Concept highlighted the importance of civil entities operating in the area and asserted the Alliance's commitment to cooperation. NATO policy on civil-

³ *CIMIC Field Handbook – 4th edition*, Civil-Military Co-operation Centre of Excellence, Olanda (Haga), 2016.

⁴ AJP-3.4.9, *Allied Joint Doctrine for Civil-Military Cooperation*, Edition A Version 1, 2013, p. 1-4.

⁵ AJP-3.19, *Allied Joint Doctrine for Civil-Military Cooperation*, Edition A Version 1, 2018, p. 2-1.

⁶ The Alliance's Strategic Concept, approved by the Heads of State and Government participating in the meeting of the North Atlantic Council in Washington D.C., 24 aprilie 1999, art. 60.

military cooperation was established by a document of the Military Committee (MC 411/2). This text is not an official NATO document and therefore does not necessarily represent the official views of the governments. Overall, NATO can interpret NATO policy regarding civil-military cooperation in accordance with their national provisions.

Since Summits in Poland (2016) and Belgium (2018) have reiterated the role of collective defense of NATO to counter the developing hybrid threat scenarios the interface, of civilian-military the active forces of the Alliance and civil, should be improved to enhance the resilience of military and member states companies. Measuring shortcomings of the past, inadequacies, and successes during previous missions will help NATO to fulfill the responsibility of the 21st century: "Protecting and defending territory and populations against attack, as set out in Article 5 of the Washington Treaty"⁷. Also, the last two NATO summits indicate political orientations towards the two Strategic Headquarters to find regenerated answers for collective defense, in light of a hybrid scenario and a territorial threat. Although the possibility of big battles of tanks in the northern plains of Germany is likely to remain a ghost of the past, perceptions of the Cold War cannot serve as a blueprint for ensuring the collective defense in these more complex conflicts, which often do not have a clear beginning or an easily identifiable offensive action.

Therefore, the Alliance is challenged to gain the opportunity to define ahead of time the scope and implementation of the interaction between military and civilian areas to make NATO member states and their societies more resilient to hybrid threats. Being the dedicated ability of NATO civilian-military interface, civil-military cooperation, although established for a different strategic context remains important to align civilian and military capabilities to support defense effort of functional Member democratic society in times of crisis.

Approach and development of civil-military cooperation in the UN

After 1945 and especially after the Cold War, UN, its agencies and non-governmental organizations (NGOs) increased in number and capacity. At the same time, the concepts and military capabilities for increased civil-military coordination, as the military had a more frequent involvement in humanitarian assistance and operations between peace and war. The lines between civilian and military activities of the organizations began to fade, requiring greater coordination between them.

In the 21st century, "security" has taken on new meaning as today's conflicts have become increasingly violent, the concept of "human security" appeared. In 1994, Human Development Report launched by the UN Development Program established that security of human communities and civil society resistance two elements are important, peace and stability in the world. Unlike conventional national security threats of all kinds, human security aims to limit conflicts and reduce instability in treating the symptoms so as to prevent their outbreak. Strengthening peace and preventing conflicts have grown more intense due to concerns regarding civil-military cooperation in response to this paradigm shift.

UN human security approach, geared towards people, is comprehensive, specific and context-oriented prevention, as outlined in the Manual of human security. Meanwhile, demand and momentum and holistic approach increased, collaborative and coordinated in the international intervention. Since humanitarian response capabilities, to promote peace and civil society refers increasingly more to civil entities, including policy instruments, such as the police, civil-military cooperation developed as a management conflicts link. Many civilian and military actors realize that it is more than coincidence that multinational operations are becoming increasingly integrated.

In fact, civil-military cooperation in peace-keeping operations has always been determined by the need for better coordination of the mission, based on two needs. First, the

⁷ *Tratatul Atlanticului de Nord*, Washington DC, 4 aprilie 1949, art. 5.

complexity of peace operations environment requires better coordination between actors, programs and activities, because of the impact of transverse and interdependence. Secondly, there are increasingly limited resources to the growing demand for consumption, which indicates that they must do more with less. You must use available resources (including funding for peacekeeping operations) in a more reasonable, efficient and effective way. In other words, not only conflict must be managed better itself but the ways and means to ensure peace, too.

Conclusions

In conflict situations, civil-military cooperation provides the necessary freedom of action of the military operations commander, limiting civilian interference in the operations, actions contributing decisively in avoiding collateral damage. Including the action of the civilian actors in the planning process of multinational operations helps to avoid competition and redundant effort. What is clear is that civil-military cooperation is a necessary tool for civilian objectives and military to be in agreement, especially in a hostile environment or in a situation of conflict where partial military competences do not harmonize exactly with those of the civil party (international or non-governmental organizations). Thus, the structure of civil-military cooperation is a catalyst, an area of mediation between the two structures common purpose and mission. Moreover, the channel transition to civil government, providing access to local resources.

Currently, multinational operations are conducted in a coherent framework, which makes this civil-military cooperation necessary to be based on requests and change needs. In this respect, the work of civil-military cooperation in different situations may be restricted in certain areas. Following the acceptance and understanding at a global level, civil-military cooperation is an integral part of each multinational military force. However, while international organizations and national governments have accepted the fundamental role of civil-military cooperation by developing additional courses of education and training for staff carrying out civil-military cooperation, there is still much to be done to achieve maximum efficiency of civil-military structures cooperation and to improve coordination and cooperation in the field - conditions necessary to achieve mission objectives.

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MODERNIZATION OF THE ROMANIAN NAVAL FORCES IN CONTEXT OF THE BLACK SEA REGIONAL SECURITY

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Abstract:

The motivation for choosing this theme is to bring to the attention of the situation of the modernization of the Romanian Navy combat capabilities, support, systems and equipment platforms.

Security in Black Sea region remains precarious, and the answer is based on active engagement of NATO allies in the region. Bulgaria's and Turkey's attitude to collective involvement in managing a crisis is hesitant, promoting rather a steering of NATO's effort towards the Baltic, justifies efforts to modernize the Navy. The region's security environment is the product of the various interests of the coastal states and their neighbors. Through this approach, Romania can become a key factor in the wider Black Sea area. The Romanian Naval Forces can contribute to the strengthening of the security environment, but some measures are needed to increase confidence among the Black Sea states. NATO must also take a firm stand to address the security challenges that exist in this region.

The purpose of this article is to highlight the necessity of endowing / upgrading the capabilities of the Naval Forces to match the current security environment in the Black Sea region.

Keywords: regional security; crisis situations; Euro-Atlantic security; critical area.

INTRODUCTION

The Black Sea region is an important component of security and stability and the Euro-Atlantic area. Located at the crossroads of Europe, Asia and the Middle East it is an important transit route for trade and especially for energy resources. The instability of the Black Sea region can influence the security and stability of the entire Euro-Atlantic area. However, the Black Sea region does not raise major security issues that can be exploited by terrorist organizations and organized crime as long as riparian states remain determined and involved in preventing and combating illegal activities by enforcing fundamental principles of international law.

The Black Sea, a critical area for Western security, is increasingly subject to disturbances and threats. This state of instability affects not only NATO, but also security and regional economic development. From the perspective of regional realities and security challenges, the Alliance has strengthened its deterrence and defense position through tailor-made measures. These are a peacetime demonstration of NATO's decision to ensure effective discouragement and credible collective defense¹.

¹ <https://monitorulapararii.ro-accesat> în data de 17.12.2018.

Russia has greatly developed its strategic footprint in the region after the annexation of the Crimea. The Peninsula serves, from a military point of view, as an outpost for the widespread projection of Russian force to southern Ukraine, the Balkans and Turkey. Due to the fact that Moscow's military presence is no longer constrained by legal agreements with the Ukrainian side, the Crimean geostrategic potential is fully used by Moscow to implement a broad spectrum of power tools that support each other.

The role of the Navy is to defend, promote interests and rights sovereigns of Romania at sea and on the river, independently or together with others forces within the framework created by joining NATO. This role is fulfilled in a new security environment in the area of interest of the country. Their main features of security environment are: increasing interest NATO for the Black Sea area as the flanking region of the Alliance and its obligation Romania to promote the interests of this organization in the area; the growth the interest of the European Union in the Black Sea area; participation Georgia to the Partnership for Peace; considerably diminishing the threat of major military confrontation in the region, as a result of the development of political dialogue and cooperation between states economic, naval, security and trust; accentuation Western states' concerns about the exploitation of hydrocarbon resources in the Caspian and Marine Subsoil and the possibility of producing some ecological disasters affecting the marine environment, the river and the seaside; possible negative developments on the sub-regional level in the field of democratization, respect human rights and economic development that could lead to acute crises with destabilizing effects; the proliferation of new risks and threats of nature asymmetric; naval terrorism; illicit traffic of goods, dangerous substances, weapons and people; illegal migration.

The abolition of the Warsaw Treaty and the dismantling of the former Soviet Union have resulted in the emergence of new states in the area and the outbreak of inter-ethnic conflict that have led to the transformation of the Black Sea region into a high-risk area, marked mainly by the political-economic disputes between the riparian states, but also by the concern of other states, even non-riparian, to impose their interests in the area.

Strategic and geopolitical stakes have always been major in the Black Sea region. The regional development, both positive and negative, continues to affect the vital interests of countries and peoples along the shore, reverberating well beyond these limits.

MISSIONS OF THE NAVAL FORCE

As it emerges from the Doctrine of the Naval Forces, the Navy performs missions in accordance with the objectives of the defense policy and its priorities, with the principles and concepts of the National Defense Strategy of Romania, the Romanian Army Doctrine, the evolution of the internal and international security environment and the decisions of the authorities constitutional competence.

In contributing to Romania's peacetime security, the Navy performs: ensuring the security of Romania's maritime and river space, defending its own systems against cyber attacks, deploying or participating in specific actions to evacuate Romanian citizens from abroad, participating in the fight against threats in the Sea Black, Identifying Military Risk Factors Based on Information, Surveillance and Recognition Capabilities (ISR), Ensuring Continuous Transport and Communications Security. In order to defend the independence, sovereignty and territorial integrity of Romania, the Naval Forces are used in: the participation in the identification and deterrence of any kind of aggression against Romania, the gradual raising of the fighting capacity of the structures, the engagement of all capabilities to counteract hostile actions against national security, the rejection of any armed aggression against Romania, independently, jointly and / or within the collective defense of NATO or the EU mutual assistance clause, the integrated action on the entire national territory, with the NATO force package designed to act on the basis of the provisions of art.5 of the North Atlantic Treaty.

In the framework of promoting regional and global stability, including the use of defense diplomacy, the Navy performs: participation in peacekeeping operations / NATO-EU,

OSCE and UN-led crises, participation in humanitarian, search-rescue operations, and disasters, participation in military operations in coalition for the fight against terrorism, extremism, insurgency and international stability, contribution to national and international efforts to control armaments and combat proliferation of weapons of mass destruction².

Of course, naval military actions can not be limited to the maritime security needs demanded by the specific risks and threats that manifest in the Black Sea at the beginning of the millennium. That is why all the riparian states pay due attention to the preparation of their naval forces to combat the military and non-military threats and threats, preparing to cope with both peacetime and crisis and war operations.

Naval Forces characteristics, responsiveness, flexibility, self-sustainability, mobility and accessibility enable them to be used to support allies and partners, discourage aggression, influence unstable situations, and respond to aggression if necessary.

The role of the naval forces is to: allow access to certain areas of the land, control the sea, and prohibit the use of the enemy by performing the following missions: naval surveillance; control of commercial navigation; protection of maritime communication lines; jaunt and embargo; banning the use of sea areas for enemy military operations; influencing the outcome of land-based campaigns that have the objective of occupying territories.

DEVELOPMENT OF NAVAL FORCES

Due to the growing challenges of the global security environment, recent developments in the Black Sea security environment and the rapid pace of development and evolution of new technologies (robotics, artificial intelligence, miniaturization, generation, directing, and energy storage) the Romanian Navy will be in the near future in the face of complex choices that can only be tackled together with the other categories of forces and services in a common framework to ensure a coherent and complete response to the potential threats present and future.

The need to harmonize national security interests with NATO and EU interests and policies in the wider Black Sea area, the projects of modernization and re-technology of the entire national defense building make the next period an intensive effort to develop the three components of power of the naval forces.

Within the moral component, the principle that Naval Forces (NF) personnel is the most valuable active from the past, present and to the future for the prime consideration. Thus, the emphasis should be on increasing the attractiveness of the military career, by raising and educating the leaders, promoting the values of the Romanian Naval Forces and the continuation of its traditions, respectively on the development of cohesion, from the level of microstructures (crews, groups, etc.) at the level of the entire personnel of the NF (body spirit) and the promotion of the image of the elite component of the Romanian Armed Forces.

The Navy currently has a limited number of forces and means of combat capable of participating in Romania's defense, allied defense and civil emergency management within NATO and the EU, which has direct implications for compliance with the obligations assumed by the partners NATO / EU. The delay in the 22R frigate modernization program leads to a gradual decrease in their operational capacity, which seriously affects participation in future missions and also affects Romania's image as a member of NATO's trust.

Recent them developments keep military and security in the Black Sea have given an insight into the need for modernization of the Romanian fleet and its components, and the decision of major investments in the capabilities of Naval Forces will bring, in addition to domestic benefits, a major contribution to increasing capacity defense of Permanent Navy Groups, as required under the current NATO Defense Planning Process.

² FN-1, Doctrina Forțelor Navale, Bucharest.2018, cap.III

The Romanian Navy, a numerical inferior fleet, in order to become a fleet in action, needs to develop the quality of the combat systems and the C2 system, and consequently to develop those capabilities that represent a continuing threat to a potential enemy.

The inadequacy of the economic development correlation with the defense strategy has influenced the reform measures applied to the Romanian Armed Forces and implicitly to the Romanian Naval Forces regarding the major programs with effects on the performance of the supply programs. Budgetary restraints have created difficulties in the implementation of research, endowment or maintenance projects, causing gaps between forces to participate in multinational operations. Now, more than ever, it is necessary to find an optimal solution to replace the technique and the means to participate in multinational operations with high performance, quality-based techniques. For this, it is necessary to develop development, procurement and production programs, using internal resources and completing the endowment programs started and approved to maintain the commitments assumed through continuity, consistency and political unity.

Based on strong commitments to increase defense spending, Romania has now become the sixth member of NATO, alongside the US, Greece, the UK, Estonia and Poland, which respects the 2% of GDP set. Thus, based on the procurement plan that will run over the next 10 years, the Romanian Army will have the latest generation capabilities to cope with and contribute to the Alliance's joint effort to ensure regional security³.

The projection of the development and modernization of the Romanian Navy aims at strengthening combat capabilities in the maritime, air, land and underwater environment as part of NATO and the EU.

The combat and support capabilities listed above, specific to the Navy, required to achieve the objectives and missions, in line with the operating concept, are: surface combat, submarine combat, enemy air defense, coastal struggle, special forces operations, C4ISR support and electromagnetic and information spectrum, resource support (education and training, coastal support infrastructure).

Considering the development of combat and support capabilities, respectively the platforms of systems and equipment necessary for the fulfillment of the missions and objectives, it is emphasized that:

The submarine is the most effective weapon in the field of naval combat, being a means of deterring any action taken by a potential aggressor. It can contribute decisively to maintaining balance in the initial phase and decisively influence the gaining of supremacy in the theater of operations. The submarine remains a vital option for the Romanian Navy, its existence being the basis for their credibility, being the decisive factor in the deterrence.

Fighting / Corvette Multi Level Fighting Platforms also remain basic medium and long term options, both for fulfilling the obligations assumed within the Alliance and for defending their own maritime interests outside the Black Sea as well as the core of the naval forces to carry out the missions defense in the Black Sea. They must have a range of action, be capable of performing missions in remote seas.

Rapid rocket launchers are an option that radically increases the capabilities of fighting surface ships and can make a decisive contribution to the defense missions in the Black Sea.

To increase performance indices in coastal combat capabilities and special operations, platforms/systems/equipment for amphibious operations, extraction / extraction of Special Operations Forces, EOD actions are required. For both coastal actions, especially in the lagoon area, but also for operations specific to special operations forces, it is necessary to maintain and develop long-term ships and helicopters (helicopters).

One of the most significant vulnerabilities in the case of coastal aggression is the existence of the navigable arms of the Danube Delta, more recently the Băstroe Canal, which

³ Scipanov Lucian Valeriu, *Proiecția Puterii Maritime*, Ed. UNAp „Carol I”, București, 2018, p. 161.

allows rapid access to the depth of defense with important forces, especially in the context of a local situation that can become favorable to the possible aggressor. In this context, the maintenance/upgrading of artillery carriers, including mining / de-mining capabilities, are long-term options.

In view of achieving the specific objectives of the Navy in the next decade, the continuation of the process of development and modernization of the major forces and combat equipment that the "Romanian Army 2026" program prefigures is essential. Their realization will ensure the passage of the Naval Forces from the defense capabilities with national limitations to ensuring a disincentive at the regional level.

Under the "Romanian Army 2026" Program, for the Naval Forces, the following modernization and endowment programs are presented:

- Multi-corvette battle platforms to meet the obligations assumed within the Alliance and to defend their own maritime interests outside the Black Sea as well as the main core of the naval forces to carry out defense missions in the Black Sea;
- Modernization of T22 type fighters and missile-carrying ships to achieve full capabilities by replacing existing weapons systems with NATO-equipped equipment and weapons;
- Mine hunter to increase the naval forces' performance in fighting against seaports, coastal waters, routes and access passes in ports, at mandatory crossing points, in order to ensure navigation security of commercial and military traffic;
- Mobile Missile Launchers Mobile Launchers (SIML) enabling a capability to perform combat operations against surface ships adversely affecting the destruction / neutralization / deterrence of enemy naval forces in order to protect their own maritime communications independently or in cooperation with other types of forces and weapons composed of the General Staff of the Naval Forces and the Romanian Armed Forces;
- Modular naval platform for the creation of modern, state-of-the-art multi-purpose naval capabilities, fully interoperable with those of NATO member states, to carry out effective action to support the fight against water, water and air. Standard combat support platforms are the most suitable ships for regional and coastal support actions, while having adequate self-defense capabilities in all combat areas with a high adaptability to missions and capable of meeting the most demanding requirements of the war of the future;
- Special diving vessel for equipping the Naval Forces with modern platforms for supporting and naval intervention with divers at long distances and in their own area of responsibility;
- Fast Divers for Diving For Diving Structures of the Navy with modern ships equipped with specific equipment and technique for supporting and intervening with small and medium distance divers in their own area of responsibility;
- Logistic support vessel for the creation of a naval capability designed to ensure the rebuilding of the ship's fighting capacity, ensuring the completion of fuel, ammunition, food, drinking water supplies and technical assistance necessary to re-establish the equipment, aggregates and equipment on board, as well as providing medical assistance to craft staff;
- Helicopter with ASW and ASuW capabilities to achieve an anti-submarine fighting capability on multi-function corvettes and a proprietary airborne capability to provide tactical and logistic shipments to the Marine Corps, Force and Special Forces, during specific actions;
- Helicopter with transport capability and SAR to achieve a proper air transport capability to provide tactical and logistic transport for naval infantry, boats and operations for special operations, while conducting specific actions;
- Multi-functional platforms for the provision of terrestrial, multifunctional or specialized platforms with constructive and functional features that ensure sustainability, compatibility and community with transport capabilities provided by the Allied armies are the major requirement for the capabilities packages are to be made available to NATO;

- TBT Armored Carrier in order to ensure increased mobility and adequate protection of embarked personnel during specific missions in any area of relief, regardless of weather, season or weather conditions;

- SCOMAR system for electronic and visual surveillance of sea and air space at low height;

- ISTAR capabilities to provide the Naval Forces unit with the capability of electronic warfare and ISR capabilities by multiplying/diversifying research, surveillance and recognition capabilities, as well as expanding action areas (Multi-Sensor Multi-Sensor Multi-Sensor Systems (UAS));

- NAVCIS to support the information management activity for the purpose of its timely and unallocated transfer from supplier to user to correspondent, as well as its processing to assist decision-makers and commanders.

Supporting national interstitials is obviously done through political and diplomatic means within the existing forums, but behind them there must be a strong national military system and military system, speaking of the Black Sea – a naval (naval force) capable of ambition and national aspirations.

Referring strictly to national defense, we understand by the Naval Forces capable of a modern fleet and a complete infrastructure designed primarily to discourage, carry out complex operations in all environments, both in the seaside and the large seas.

In the current context, requirements for the Navy are even greater, requiring fast deployable capabilities, with long-lasting capabilities and self-supporting logistical support.

We assume that only such capabilities can ensure, in the event of a conflict – irrespective of the existing security situation – the protection of maritime and river communications routes, ports, to the needs of the economy, the safety of oil offshore oil platforms and the use activities biological resources in the exclusive economic sea area, annihilation of terrorist actions at the seaside, in the *riverine area*⁴, and especially the combat of surface combat ships, submarines and other forces that are attentive to the sovereignty and integrity of the state.

Achieving these capabilities will ensure the passage of the Navy from defense capabilities to national limitations to disincentive at regional level.

We can also say that the overall objective of the Navy for the years to come is to continue the process of strengthening the combat capability of all structures, to allow participation in the surveillance, discouragement and rejection of any aggressive actions against Romania in accordance with the requirements plans developed at national and Allied level, participation in the fulfillment of the international engagements assumed by Romania, as well as support of the central and local public administration authorities in the management of emergency and crisis situations and increase resilience.

Taking into account the teachings of our forerunners who, in comparable situations, had the power and the skill to convince "The explanation of this lack of continuity in the development of the navy must be sought first of all in the ignorance of the importance of the maritime power by the Romanian public opinion. The indifference of public opinion for the sea, navigation, ships, etc. is not in any maritime country as great as ours, and as long as this evil is not removed, it will not be a logical and continuous development of the navy, for that such development necessarily requires the continued support of all the governments that would succeed in the country's leadership⁵.

As a conclusion, we reiterate the conclusions of two great Romanian marine theorists, Eugen Rosca and Gheorghe Koslinski, who in 1923 concluded the work "We need the

⁴ Scipanov Lucian Valeriu, *Operații riverane*, Sesiunea de comunicări științifice TAOFT, Ed. UNAp "Carol I", București, 2018, pp. 232-233.

⁵ Eugen Roșca, Gh. Koslinski, *Avem nevoie de Marina Militară*, București, 1923.

Military Navy" as follows: "The naval power is not due to happening or improvisation, but it results from the thorough preparation of all the complex elements that make up it.

Let us create the Military Navy we need; set up our naval program, train our staff, and prepare a naval base.

We have to get into this truth and put our work right away, because we have no time to lose. Let us not seek the escape in exceptional, improvised, last-minute measures, from which to save the vital interests of the country by miracles.⁶ "

CONCLUSION

In conclusion, we can state that the Romanian Naval Forces have a balanced, modern and flexible structure, able to fulfill their assigned missions. A permanent objective for the Romanian Navy remains to build and maintain a structure that will become a credible instrument of national and allied security policy at regional level and to contribute, together with the allies, to maritime security in the wider Black Sea region.

Romania, through its military capability, will help to strengthen NATO at its most vulnerable point - the Balkan area, the naval component actively contributing to the closing of the security arc that our country and Bulgaria would achieve between Hungary and Turkey. This arc will decisively enhance NATO's South-East European force and restore the continuity of the European Alliance and balance its northern and southern parts.

I consider that Romanian Naval Forces with an observation and surveillance system at the seaside (optimal variant), 1-2 marine patrol planes, 2-3 submarines, 2-3 frigates, 2-4 multifunctional corvettes, 2-4 mine hunting, 1 -2 logistics support vessels, divers and infantry units, is sufficient to carry out the undertaken missions.

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*** <http://www.manp.nato.int>

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⁶ *Idem.*

CURRENT APPROACHES TO THE CONTEMPORARY SECURITY ENVIRONMENT

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Abstract:

Security has been a major concern since ancient times, the need for security being placed surely as a gun after physiological needs, according to Maslow's Pyramid. Starting from this assumption and analyzing the publications of the domain of interest, the author's work describes the contemporary security environment from the perspective of the reference object. Conceptual delimitation is the process of approach, featuring the need to bring into the foreground the importance that the vast, complex and interdependent domain of security is enjoying due to the changes in the environment. This paper updates and summarizes unique security approaches, giving a deep insight into the interpretation of critical infrastructure issues. The causality of multi-factor interdependence provides a more comprehensive view of the new meanings with which security is identified in the contemporary context, causing changes in the environment in the present time.

Keywords: *national security; national interests; contemporary security environment; critical infrastructure.*

Introduction

Current geopolitical and geostrategic trends and prospects are increasingly extending the notion of "national security" on the economic components, information and communication technology, diplomatic, ecological or other issues. Critical infrastructures are usually vulnerable to internal or external factors and are at risk of being destroyed or brought into a non-functioning state.

Security has been, since ancient times, a major concern, as it is evidenced in Maslow's pyramid (Figure 1), where the need for security is certainly located as a level of importance according to physiological needs. Beyond the fact that it is a concept of seniority, the reading of publications in the field of critical infrastructure security emphasizes that there is no accepted human definition of "security", an ambiguous term. The ambiguity of the concept results from the multitude of dimensions it encompasses being “*exacerbated by the fact that, a wide range of political actions and activities are involved - depending on circumstances – in the domestic political life of states under the concept of national security*”¹.

In this world of globalization, in which partnership becomes essential, a person, an institution, a people of the world without a consistently shaped identity, does not offer too many guarantees of confidence or credibility. *Along with security, partnership becomes a national interest.*

¹ Bidu, Ioan; Troncotă, Cristian, *Coordonate de securitate*, Editura ANI, București, 2005, p. 9.

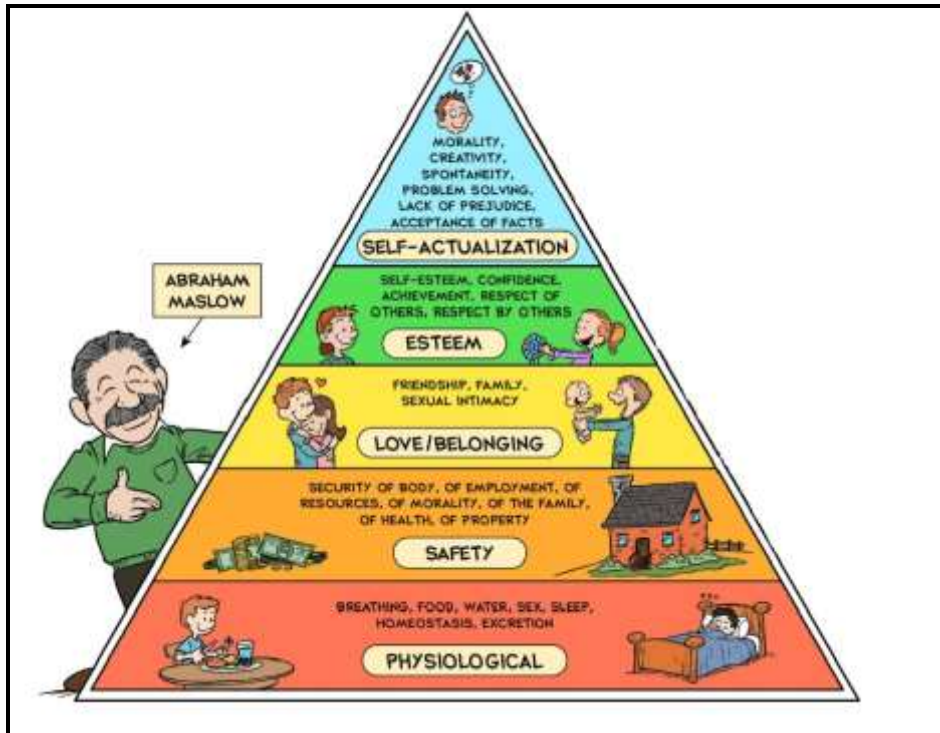


Figure 1: Representation of Maslow's Pyramid²

International relations take place on informational coordinates, where the information is super-concentrated and its dissemination is hyper-specialized. Informational aggression is, in fact, a conflagration or a disaster without a beginning or an end, which continues legally, in both an open and a secret way, accomplishing economic, political, cultural, religious and even military purposes.

Description of the contemporary security environment

The concept of security is a commonly used term being directly or indirectly associated with the existence of humanity as an individual, as well as of small or large social groups. The literature in the field offers a variety of definitions of security, which is evidence of different theories from understanding the meaning and meaning of the term. Another approach to defining security is also affected by the reference subject; in fact, different definitions are used in the expression of human security, others in relation to national or international security (economic, political, cultural, ecological, etc.), or with regard to the safety of the technical devices.

Under the concept of security, we can summarize the unique approaches as follows:

- Security is a state where the risks and threats resulting from them are minimized or eliminated.
- Security is a state in which the given object is not endangered by its legal interests.
- Security is understood as a complex of social relations governed by law and protecting the rights and interests of individuals, social groups and the state.
- Security is considered to be the ability of the object, the event, the process to protect its natural and its basic characteristics under intentional, disruptive and decorative activity, either from the outside or inside the object.
- Security is perceived as a feature of the system that expresses the ownership of the system created in accordance with the principles of stability, self-regulation, and integrity;

² <http://loribush.org/tag/homeless>, found on 26.02.2019.

security is required for each system element because destroying any element of the system will destroy the entire system.

- Security is considered a decisive condition (guarantee) of the person, the social group, the existence of the state, which allows the protection and multiplication of material and cultural wealth.

- Security provides a comprehensive set of measures to guarantee and protect the life interests of all security objects.

- Security, in its absolute sense, expresses the absence of security risks and threats to the material and spiritual sphere of existence.

- The security base is minimizing security risks and threats with a tendency to eliminate them.

In keeping with the firmness of the above-mentioned approaches, we must point out that in order for a person to be safe, feeling safe is not to live and to exist without hazards, risks, and threats. Security does not just mean the absence of security risks and threats but, above all, the protection against them.

The security margin of human, social, state (hereinafter referred to as objects) will always be the result of the interaction between external and internal security risks and threats, and the properties, abilities, and capabilities of protecting the security object, strengthening vulnerabilities

Definition

At origins, the term "security" comes from Latin, where *securitas, securitatis* means "*being sheltered from any danger; a sense of confidence and tranquility that one gives to the absence of any danger.*"³

At the same time, a series of questions arise about what we mean by this concept, becoming a central one in contemporary and international relations, especially in the field of *critical infrastructure protection*⁴, defining the characteristics of the operational environment of the latter. The approach to defining the concept of "security" has become more difficult nowadays, taking into account the many dimensions of security corroborated with the diversity of the dangers and threats to the security of the contemporary world.

In the process of defining the security concept, two essential issues need to be taken into consideration: *security for whom and against (whom)?* Security is associated either with an individual or with a community, defined, in turn by a series of characteristics, among which the most important is belonging to a strictly defined territory, designated by the house, locality, region, country, group of states, members of a formal union or located in a subcontinental or continental geographic region and finally on the globe.

Also, we consider it important in defining the concept of "security" to introduce some of its definitions for facilitating further analysis.

Dimensions of the security environment

In a pragmatic sense⁵, the concept of security can be equated with the phrase "*absence of danger*" and the insecurity with the phrase "*the presence of danger*", and it can be

³ The explanatory dictionary of the Romanian language, the Romanian Academy. Institute of Linguistics "Iorgu Iordan", II Publishing "Encyclopedic Universe", Bucharest, 1996, p. 969.

⁴ Although there is no universally accepted definition, critical infrastructures are generally referred to as those facilities, services, and information systems that are so vital to a nation that putting them out of service or destroying them can have destabilizing effects on security the national economy, the national economy, the health of the population and the efficient functioning of the government. Critical infrastructures are critical to the stability, security, and security of systems, playing an important role in running economic, social, political, informational and military processes.

⁵ Chira Aurelian Vasile, Ţical George, "*Securitate și globalizare*", 2011, available at <https://www.punctcritical.com/security-and-globalization.html>, accessed on February 22, 2019.

appreciated that always the security of one means insecurity for another. One of the earliest definitions of security belongs to Arnold Wolfers: "*security, objectively, measures the absence of threats to acquired values, and in a subjective sense, the absence of fear that such values will be attacked*"⁶.

Highlighted in the tendency of states to constantly adapt to new realities through attitudes and behaviors suitable to the dynamics of concrete situations, we will mention that in the second half of the sixteenth century, "security" referred to the means of protection, to a weak object requiring protection. During the eighteenth century, security referred to the overly trusting feeling. What highlights the necessary distinction between security - the subjective feeling - and safety - the objective reality in which they were submerged, especially since the 12th century.

So, safety is the maintaining in nominal parameters of the factors (internal and external) that ensure the fulfillment of the purpose and the proper functioning of the systems, while security includes plans and measures considered in some situation, based on scenarios so as to ensure accomplishment of the original purpose, role and goal.

In the eighteenth century, Alexander Webster states that "the fleet is the security of Great Britain." Metaphorically, security becomes a good that denotes a visible and solid entity that evades or avoids life and goods from external threats. Protection can be provided by immaterial goods, such as the economy, which provides a certain sense of security.

With the consecration of nation-states in the mid-nineteenth century, the issue of national security started to traditionally be addressed through the concepts of peace and power. Peace became the central concept of idealists and dominated international relations especially in the interval between the two world wars. Thus, in the realistic view, security became a consequence of power. The degree of safety was determined by the accumulation of sufficient amount of power to discourage an opponent or to be defeated in case of involvement in a conflict, and the threat of war and war itself was the quintessence of security.

Researching the variety of conceptual approaches, we find that the notion of national security must be seen in terms of its elements such as, on the one hand, *national interests*⁷ on the other, *threats*⁸ and *vulnerabilities*⁹. It should be noted that during the Soviet period, the concepts of national security and interest were not recognized, being substituted by a supposedly higher goal, for example the union of proletarians from all over the world or the victory of the world socialist revolution. The profound changes on the European continent since the 1990s led to the search for new models of behavior and coexistence of European nations, primarily concerned with international and regional security in relation to its national interests. Also, national interest is the factor behind national identity, social cohesion and the obedience of the population. We conclude because, when we speak of national interest, all

⁶ Wolfers, Arnold, „*National Security*” as an Ambiguous Symbol in *Political Science Quarterly*, Vol. 67, No. 4, 1952, p. 485.

⁷ *The national interest* is the active expression of the needs of the national state, a goal which constantly and continually orients its conduct. In fact, in theory, any national state, in everything it does, seeks to achieve national interest. The latter is a multidimensional concept, referring to all areas of human activity. That is why we can speak of national interest in economic, military, political, cultural, diplomatic, social, financial, informational terms.

⁸ *Threats to "critical infrastructure"* are capabilities, strategies, intentions, plans that pose a threat to them, materialized by attitudes, deeds, acts, facts that create imbalances or instability, and create dangers with impact on national security. As an indicator of appreciation of an imminent threat or threat, threats can be identified by the following cumulative characteristics: the type of actions envisaged (open, sneaky, mixed, violent, nonviolent), form (attitudes, gestures, acts, facts, events, phenomena, human actions), the stage (latent, possible, probable, imminent) and their nature (political, economic, military, social, environmental, social).

⁹ *The vulnerability of a "critical infrastructure"* is given by the relationship between the probability of a real threat to the proper functioning and the ability of the system to cope with the threat. Vulnerability analysis is based on a superior understanding of the spectrum of threats that can lead to catastrophic effects in system operation.

citizens of the country or the vast majority of them agree to make sustained efforts to achieve strategic goals, to act in a united and solid manner in the same direction, to be aware of the measures adopted by the governors to ensure the sustainable development and security of the country.

Another definition is provided by the work of *Religion and Security in 21st Century Europe – Glossary of Terms*, where security "means the situation in which a person, group of persons, state, alliances, following specific measures taken individually or in agreement with other actors, is assured that their existence, integrity, and fundamental interests are not jeopardized"¹⁰.

It is mandatory to make a distinction between the terms peace and security, the first defining "lack of armed conflict"¹¹, while the state of security refers to "lack of threats"¹².

It would be useful to examine the phrase "national security", which is an English version of the concept of "national security," where "nation" does not mean "nationality" or "ethnic group" but refers to "people" or "state"¹³. That is why the translation of the term "national security" is equivalent to "national security" or "state security". The state presents simultaneously an idea, an institution, and a physical basis, but also a complex organizational structure, a community and a policy tool¹⁴. Thus, we can state that a state is a tool for promoting security before being a subject or a reference of that. It represents the body that provides the mediation between the national interest, defined in a unitary way, and the interests of the communities within it.

Conceptually, the issue of national security is the subject of permanent reconsiderations determined by the outcome of the interaction of six factors:

- the dynamics of the international system and the evolution of the ways of aggression of nations;
- the peculiarities of the national situation specific to each nation;
- the geopolitical specificity of each nation;
- the possibility of conceiving security policy either in aggressive ways or in defensive ways;
- the different dimensions of national security for the big powers and for the small states (for the first, national security gains a regional and even global dimension; for the latter, security is realized on the basis of the evolution of the ratio between the great powers and the dynamics of their own relations with these and with neighbors);
- differences in the theoretical perspective in the analysis, design, and implementation of the national security strategy.

So, the permanent changes that interfere with the dynamics of any of the factors listed above determine the need to redefine, continuously update the national security and security concepts.

The amplification of non-military risks and threats to national security over the past years only reconfirms the importance of security as a state's preoccupation.

Prosperity becomes a major objective of the state. The intense internationalization of trade commenced after the Second World War, and then with the end of the Cold War, the transition to globalization made the vast areas of the planet reach the prospect of a level of prosperity comparable to that of the West. "Along with security, prosperity is becoming a

¹⁰ Buță, Viorel; Emil Ion; Mihai Ștefan Dinu (coord.), *Religie și securitate în Europa secolului XXI – Glosar de termeni*, Editura Universității Naționale de Apărare „Carol I”, București, 2007, p. 399.

¹¹ *Idem*, p. 192.

¹² Ungureanu, Radu-Sebastian, *Conceptul de securitate în Manual de relații internaționale*, ed. de Andrei Miroiu și Radu-Sebastian Ungureanu, Editura Polirom, București, 2006, p. 180.

¹³ Waltz, Kenneth, *The Politics of International Politics*, Polirom Publishing House, Bucharest, 2006, p. 7.

¹⁴ *Idem*, pp. 65-96.

national interest."¹⁵ Famous cases such as the collapse and breaking up of the USSR, ultimately the second nuclear power of the world, demonstrate how good governance today means not only protecting a country against external hazards, but equally providing a degree of prosperity high enough to protect your citizens against potential hazards from the inside: poverty, organized crime, "black work", natural disasters, etc.

The conceptualization of the security idea has undergone a profound transformation, especially in the period after 1989, when the "traditional" notion demonstrated that a reduced conception of military capability cannot explain the multitude of factors that influence security. Superpowers have been replaced by specialized powers in strict areas, and the maintenance of national security is no longer achieved strictly through the military instrument, which leads us to the idea that the security concept itself is undergoing a process of transformation, being increasingly oriented towards economic, political and environmental issues. Moreover, it can be said that both conceptually and operationally there have been and will exist differentiations. And the many existing security concepts and definitions lead us to the conclusion that the design of this concept at the national level reveals a certain gradual approach.

From the term "security" derived from the theory and the practice of critical infrastructure protection a number of concepts emerged, such as: international/ global/ global security; continental/ regional security; sub regional security; collective security; national security, security of society, human security, cyber security, social security, economic security, political security, military security, etc.

Conclusions

The contemporary world has not stopped yet from evolving and the importance of risk management and the need to build resistance have become top issues for decision-makers who recognize that risks are no longer isolated but dynamic by nature and crossing many spheres of influence.

Security is one of the most sensitive human needs, a prerequisite for development. Hazards, insecurity or conflict not only destroy infrastructure, including social infrastructure; they also encourage crime, prevent investment and make normal economic activity impossible.

Equally true, indivisible protection for all is a fiction. Ensuring the security required for any reference to the object will depend on its abilities, opportunities, status, position, prestige or power. Already from this perspective, it is clear that absolute equity or equality cannot be achieved.

In the international security system, there is an asymmetry caused by the egotism of powerful states or countries with high external support who claim "more" security than other states; they are able to adapt the rules and conditions by influencing the institutions and bodies of collective security and international justice.

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¹⁵ Stoinea, Nicolae, *Considerații metodologice privind investigarea securității națiunilor*, în „Situția națiunilor –surse de insecuritate”, Editura Licorna, București, 1999, p. 224.

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THEORETICAL CONSIDERATIONS REGARDING THE APPLICATION OF THE MODELING AND SIMULATION SYSTEMS IN THE FIELD OF CRITICAL INFRASTRUCTURE PROTECTION

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Abstract:

This paper provides an overview about the importance of modeling and simulation systems usage in showing dependencies among infrastructures and discusses how they can be adequately captured and analyzed. Effective critical infrastructures analysis, however, must account for the complex, multi-dimensional characteristics of infrastructures and the dependencies between infrastructures.

Keywords: *system; modeling; simulation; critical infrastructure; resilience.*

Introduction

Critical infrastructures are the backbone of modern society, providing vital functionalities that support economic and social interactions. European Directive 2008/114/EC(2008)¹ defines critical infrastructure as “an asset, system or part thereof located in Member States which is essential for the maintenance of vital societal functions, health, safety, security, economic or social well-being of people, and the disruption or destruction of which would have a significant impact in a Member State as a result of the failure to maintain those functions.” Critical infrastructures such as oil and gas pipelines, electricity grids, and water distribution systems are fundamental to modern society. The well-being of society is increasingly dependent on the good functioning of critical infrastructures, and crises affecting critical infrastructures aggravate their impact on society.

The notion of system is defined as a “an organized, purposeful structure that consists of interrelated and interdependent elements (components, entities, factors, members, parts etc.) that continually influence one another (directly or indirectly) to maintain their activity and the existence of the system, in order to achieve the goal of the system”².

From a technical point of view, a system is defined as an object or set of interconnected entities that interact in a distinct way to achieve an objective, a goal with certain performance. There is a wide range of systems (e.g., technical, economic, social), and their study is often difficult, so systems will be replaced by less complex models to ease their analysis.

¹ Directive 2008/114 / EC on the identification and designation of European Critical Infrastructures and the assessment of the need to improve their protection. 2008, Official Journal of the European Union, accessed on 21st of February 2019, <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:345:0075:0082:EN:PDF>

² [businessdictionary.com](http://www.businessdictionary.com/definition/system.html), accessed on 21st of February 2019, <http://www.businessdictionary.com/definition/system.html>

Most of the human activities in a specific way imply specific modeling and simulation as a necessary step for decision-making process(*Fig. 1*) which generally consists of the following steps³:

- system analysis – the statement of the problem is made; its specification, the delimitation between the studied system and the environment; characteristic features, specific factors are highlighted.
- modeling – determines the relationships between the characteristic sizes, a simplified model, a picture of the considered process.
- simulation – test the model by trying to predict its evolution.

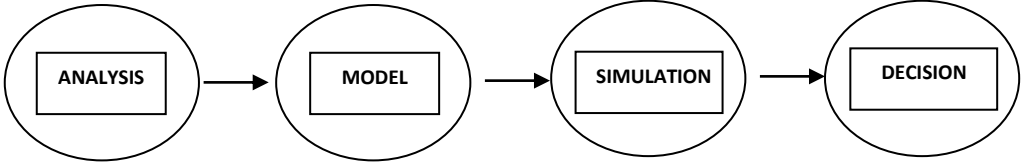


Fig. 1 Human activities relationship diagram⁴

The modeling and simulation (M & S) was used long before the emergence of modern computing systems, its oldest trace in history consisting of lines traced in sand, using objects like rods and stones to represent land features, fortifications, troop layouts, etc. Concerns in this area have progressed rapidly, so with the development of technology in the field, important steps have been taken in the use of M & S in most areas.

The concept of modeling is the process by which we produce a model, this being a representation of the construction and the way of working a particular system that we are interested in. A model should be an approximation of the real system that includes as many of its important features as possible, and at the same time it has to be not too complex in order to avoid being misunderstood or not able to experience it.

The model is developed according to the aspects the user watches, and its complexity must correspond to the reality of the system. In a first approach the models can be conceptual, physical or mathematical, but there are also different classes of classification (*Fig. 2*), the framing being made according to the way of building the model, according to the studied aspects and the existing knowledge. Modeling is the activity by which an object or system is replaced by an equivalent model.

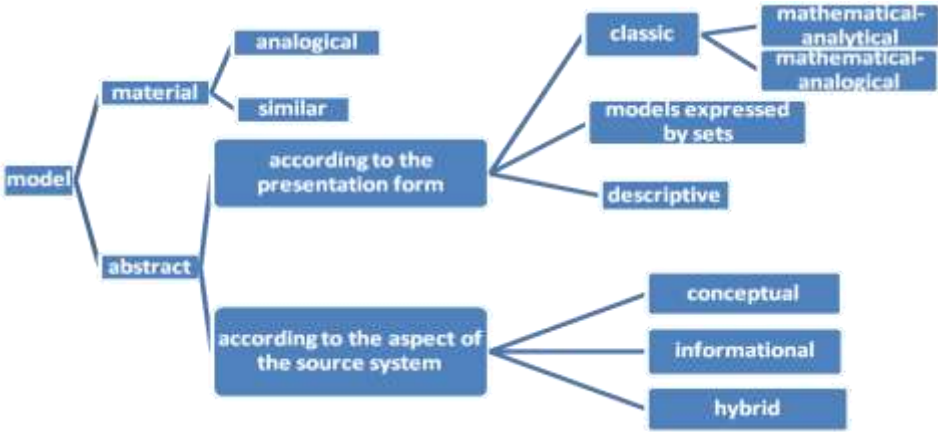


Fig. 2 Classification of models⁵

³ S. C. Stoica, M. Dorobanțu, *Modeling and simulation of computing systems - Lab notes 1*, page 1, Department of Software Engineering, Faculty of Automation, Computers and Electronics, Craiova University, n.d.

⁴ *Ibid.*

System modeling can be done using different tools and techniques, including simulation – a technique that mimics the behavior of certain situations or systems (economic, mechanical, etc.) using a model analogous to the real one in order to obtain information or specialization of staff in working with it. In other words, simulation is the technique by which the model of a real system is constructed, so that the behavior of the system under certain conditions can be studied and thus known. One of the benefits of a well-developed simulation is the ability to shape the behavior of a system over time.

Discrete events simulation is one of the modes of constructing models so as to observe the dynamic (time) behavior of the systems. There are several conventional methods for making simulation models. In the experimental phase, these models are executed for a period of time sufficient to generate results that will later be used to study the evolution of the system and which form the basis for subsequent decisions. But there are a number of specific aspects of modeling and simulation that make this approach worth taking into consideration⁶:

- The high prices of modeling and simulation software packages and the requirement of specialist training;
- The additional costs involved in staff training for complex studies through modeling and simulation because it is not a current activity of an enterprise or an operator and generally this option is not justified;
- For such studies, tenders are usually used by specialized companies, the costs of the study being significantly increased, and the time required for familiarization with the system / work subject of the operator requiring the analysis is relatively large for the model to be described correctly;
- Once the model of a system has been realized, the predictions made by the simulation will retain a reasonable degree of confidence only as long as the system, in its evolution, does not depart from the hypothesis described in the model;
- When substantial changes occur in the structure or operating rules of the manufacturing system, or in the event of changes in the economic, financial or social environment in which the system evolves, the simulation model will diminish its adequacy with reality;
- A reliable simulation model is a model that allows updating the information about the system it represents.

Simulating the operation of a system allows it to appreciate how it evolved in various conditions or following its leadership following a set of rules. In many cases, simulation is the only possible solution to make such assessments and at the same time the most cost-effective and cost-effective analysis. The manufacturing systems have far too complex behavior for their evolution to be anticipated by solving some equation systems. They do not allow organizational experiments to be carried out: such experiments would be time-consuming and resource-intensive, and their results could lead to a serious deterioration of the system itself.

Using M&S in analyzing dependencies between CIs

Dependencies between infrastructures, although usually complex enough and with many ramifications, are unfortunately not so obvious and if not identified, they can allow cascade disruptions or failures in different infrastructures, thus causing an impact with consequences on significant types of sectors, infrastructures or countries. Identifying CI

⁵ I. Starețu, C. Dudulean, "Aspects on modeling and simulation of mechanical systems for populating-configuring a virtual scene", National Virtual Learning Conference, VIth Edition, Constanța, 2008.

⁶ T. Savu, "Modeling and simulation of manufacturing systems in LabVIEW, Measurement and Automation Magazine", Year II, no. 2/2002, Bucharest.

dependencies leads to a more accurate assessment of the level of criticality of a single infrastructure item or even of an entire sector. It also allows identification of dependency chains between dependent CIs. This makes it possible to identify the most “critical” of infrastructures and to adopt more cost-effective security controls so as to reduce overall risk. Identifying such dependencies is also important in the risk assessment and planning phase so as to ensure that mitigation and recovery processes take into account all relationships between infrastructures. Recently, dependency patterns are increasingly being used to support critical infrastructure in preparation and planning against possible cascading effects.

The impact of interruptions or failures can spread both geographically, due to proximity to affected CIs and the CI framework in several sectors. Identifying dependencies is therefore an important task. However, in many cases, special types of addictions are not obvious and easy to identify. A good example is that of socially or humanely dependent addictions to changes in the behavior of individuals that can be observed during a crisis; such behavioral changes may affect infrastructures or networks in a way other than initially perceived. For example, an interruption in the transport sector can create cascading effects in communications networks (a large volume of calls can lead to the charging of networks that may later evolve in interruptions in the communications sector).

Although identification of primary or first order interdependencies may be sufficient to assess the risk of an CI, they fail to capture cascade effects at a macroscopic level. For example, one or more relatively minor incidents in an CI may cause cascade and escalation accidents to a second CI or third-party infrastructure, which in turn may affect the source of the problem initiation and thus cause a feedback effect, which will have the potential to further increase the overall impact of the incident. Identification is even more complex due to the fact that addictions can also change the mode of transition to the CI's operation. An example of this change in dependency is that when a hospital is dependent on oil fuel in the event of a power supply interruption when using emergency power modules (power generators).

By using modeling and simulation systems to plan the protection of an CI, identifying its dependence on other actors of particular importance in delivering essential assets and services to citizens increases their physical security efficiency by developing all risk scenarios and at the same time reducing costs their research and the remediation of the effects in the event of malfunctions in the normal functioning of CI.

Types of CI dependencies

Because the context gives meaning to action, examining critical behavior of isolated and out-of-space infrastructures leads to a loss of behavioral implications of that infrastructure. M&S uses relationships to support contextual specification and behavioral properties across three dimensions: functional, temporal, and spatial. These dimensions show the characteristics of the infrastructure and their collective behavior by responding to how they interact, and when and where these characteristics are connected. In this context, an infrastructure feature may be any modeling component of the infrastructure.

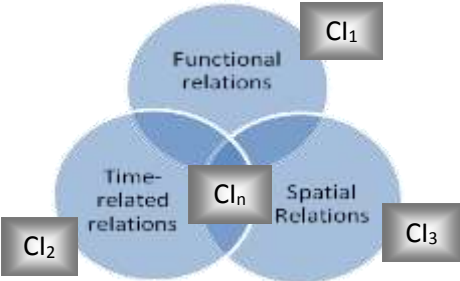


Fig. 3 Diagram of relationships established between CIs⁷

⁷ M. Papa, S. Sheno, *Critical Infrastructure Protection II*, Springer Science+Business Media, 2008, New York, USA, pp. 257-262.

Integration of CI relationships, as represented in *Fig. 3*, functional relationships, temporal and spatial relationships lead to the identification and creation of a particular way of working to shape the context and behavior of the infrastructure. An effective modeling of the dimensions of a field in terms of objects, attributes and relationships, and also allows the building of a common understanding through a common language. This facilitates the analysis of systems by modeling CIs to explore the collective behavior of integrated systems. For example, in the context of CIP, the analysis of systems could integrate, in a particular geographic region, separate models from the energy sector (electricity networks), gas distribution pipelines and transport infrastructure (local communication networks).

European projects using M & S for improving critical infrastructure's resilience

Through the FP7-Security cooperation program, the European Union has sponsored the CIPRNet⁸ Critical Infrastructure Preparedness and Resilience Research Network (CIPRNet) project from March 2013, through which a European Simulation Center critical infrastructure analysis. The CIPRN network will provide concrete and long-lasting support from the CIP research communities to the initial audience, enhance CI emergency preparedness, and provide knowledge and technology to other stakeholders to improve understanding and mitigation of the consequences of CI disruption, which leads to increased resilience. Among the benefits that the creation of this center includes: reducing the time needed to obtain quick and appropriate responses from critical infrastructure owners in case of complex emergencies, creating capabilities to support national and multinational emergency situations management, implementing advanced and simulation and analysis capabilities to document more effective disaster response and emergency situations that affect or come from complex critical infrastructures.

The SCADA LAB project focuses on enhancing the critical infrastructure protection in transport, energy, ICT, chemicals, finance, water, nutrition, health and space, research and nuclear infrastructure by developing a real SCADA laboratory to test SCADA research exercises and technologies prevent, detect and mitigate cyber-attacks in EU Member States. The purpose of the project is to solve the specific problems of current insufficient security measures taken to protect the SCADA control systems with two main objectives:

1. Development of a SCADA security testing laboratory used by targeted user groups to maintain the critical infrastructure security environment for the EU.
2. Re-using existing assets, knowledge and equipment in an effective way with realistic benefits to be achieved by the end and even after the end of the project.

The CRISADMIN⁹ Project (Critical Infrastructure Simulation of Advanced Models on Interconnected Networks Resilience) is a decision support system used in order to experiment and analyze the interdependencies between critical infrastructures and how they are affected by predictable and unpredictable catastrophic events (terrorist attacks, natural and industrial disasters). The model will assess the risks and possible effects of critical events on the quality of life by identifying the factors that trigger and increase the domino effect between interdependent critical infrastructures and the social system. The instrument will also be used to investigate the risks and impact of possible countermeasures and prevention policies.

By simulating the effects of certain policies, the model will be able to balance the dynamics of the social system, thus providing decision-makers with a tool for understanding, evaluating and updating the process and procedures already in place for crisis management.

⁸ CIPRNet – Critical Infrastructure Preparedness and Resilience Research Network, accessed on 23rd of February 2019, <https://www.ciprnet.eu/summary.html>

⁹ ec.europa.eu, accessed on 23rd of February 2019, https://ec.europa.eu/home-affairs/sites/homeaffairs/files/financing/fundings/pdf/cips/cips-grants-awarded-2011_en.pdf

Conclusions

The protection of critical infrastructure at this stage of its development can be considered a new opportunity for national security, which leads us to see the fundamental importance of the correct assessment of the vulnerability of elements of the critical infrastructure sectors as well as of the dependencies between critical infrastructures in determining the critical points that need to be protected and then the resources to be invested for it.

The methodology to be adopted for modeling and simulating critical infrastructures and the relationships established between them must integrate the functional and behavioral properties of individual infrastructures and allow analysis to be performed in a functional, spatial and temporal context. It must effectively include the characteristics of individual infrastructures and the dependencies between complex and multi-dimensional infrastructures in order to identify and understand the potential interruptions in their operation in order to increase the effectiveness of protection plans and response and recovery operations in reducing negative impacts that may arise as a result of disruptive events in the normal operation of critical infrastructure.

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ANTI-PIRACY STRATEGIES IN THE CONTEXT OF MARITIME SECURITY

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Abstract:

The current context of „maritime security" involves a diverse approach - piracy and armed robbery, maritime terrorism, illicit trafficking at sea, which can be defined as trafficking in drugs, small arms trafficking and light weapons, human beings, but also the classic, historical theft approach. At the same time, the challenges continue to change, adapt and evolve, becoming even of a hybrid nature, interconnecting an unpredictable combination of traditional war, even guerrilla, but also irregular, terrorism even with valences in the sphere of organized crime. Maritime affairs on piracy, armed robbery and maritime terrorism have recently focused on the EU, NATO and UN security and security entities, but also state-owned entities that have the naval force projection capability. Thus, in the politico-military context, the threats were defined and determined, thus defining the operational requirement necessary to ensure maritime security and communication routes.

The purpose of this article is to highlight the importance of military ships' participation in the Task Groups Maritime missions to ensure security marriages that include military action designs designed to respond to global fast-paced challenges.

Keywords: *piracy; maritime security; terrorism.*

Introduction

About the acts of bravery of Somali pirates, we read in the press more and more often. Effect of one of the many paradoxes of globalization, we have come back unexpectedly to the golden times of the pirates; with the distinction that, over five centuries ago, this time the Caribbean Sea was under the domination of the corsairs, and they no longer have English names. They are called Hussein or Muhammad and attack the giant ships of the maritime powers of our time, in the Gulf of Aden, in the China Sea or in the Strait of Malaga. Another paradox is that we do not know exactly what to do to combat piracy right now. "Who is the ruler of the great, he controls the commerce, who controls the trade of the world, also masters his riches, and therefore masters the world," wrote Sir Walter Raleigh¹, a great navy and corsair captain at the orders of Elisabeth I of England. According to specialists, maritime routes represent a particular element of the vulnerability of the current global politico-economic system precisely because the sea is the ideal context for two illicit, different but

¹ Huntington, P. Samuel, *The Clash of Civilizations and the Remaking of World Order*, Simon & Schuster, N.York, 2003 – New York Times, 10 septembrie 1992, p.A6, Washington Post 2 februarie 1996.

increasingly assimilated phenomena: piracy and terrorism. They are, however, characterized by profoundly different causes: terrorism has the main purpose of spreading terror to highlight a vulnerability and to overthrow a country's political and institutional order; piracy, on the contrary, is primarily exercised in order to take possession of public or private goods, and therefore, primarily, to profit. Commercial traffic at sea currently accounts for about 90% of all world trade. International shipping routes (see map) are located among the most industrialized areas of the world: Western Europe, North America and East Asia, particularly Japan and China. These are predetermined, especially because of geographical impediments involving mandatory passage through so-called "chokepoints"², straits or strategically important channels, easily blocked to prevent or aggravate maritime trade, and particularly of oil.

Where does the Somali attack?

In general, in recent years piracy has focused on the following areas:

- The Malaga Strait: with a length of 800 km and a transit of about 50,000 ships per year, has a high strategic relevance as the commercial contact point between Europe and Asia;
- Bab-el-Mandeb Strait; connects the Red Sea with the Indian Ocean through the Gulf of Aden and separates the African continent from the Asian continent. Bab-el-Mandeb is transported most of the oil to Europe. There are about 30,000 ships per year;
- Piracy off the coast of Somalia is considered by specialists as a specific case; precisely this second "chokepoint" has lately constituted the geographic reference for many acts of piracy, more and more and more and more and more modest in terms of ways.

On January 16, 2009, the Piracy Reporting Center put in motion an alarming report due to escalating attacks across the globe and especially off the Somali coast. The center identifies an 11% increase in corsage attacks in the world and, in particular, a "escalation" concentrated in the Gulf of Aden and off the Somali coast. 111 were identified only on the maritime route linking the Red Sea to the Indian Ocean, which represents an increase in piracy of about 200% in that geographical area.

Somalia is now a country considered bankrupt. Since 1991, he has plunged into a civil war that the international community has tried in vain to put an end to it. After the Nairobi Conference in 2004, the Transitional Federal Charter was adopted, which officially signed the birth of a Transitional Federal Government. Although this new government has been recognized by many of the members of the international community, it still has no control over its territory, with many forces being put in place during the process of pacifying the country, such as separatist entities in Somaliland and Puntland.

Piracy in figures.

- Every 36 hours a ship is attacked by pirates.
- Since 1984, the year when the International Maritime Organization established the bank for piracy, and by September 2008 there were 4,730 attacks.
- Three pirates attacks out of four, and the phenomenon is steadily rising.
- On average, less than a quarter of the attacks failed, and the most high-risk waters were those in the hemisphere. Data on 2008 allowed a similar picture to be drawn in 2007, with a concentration of episodes off the coasts of Oriental Africa. In 86% of cases, attacks were made in „territorial waters or even within the same port area,,³.

There has also been an escalation of the sums demanded as a redemption. It has gone from several tens of thousands of dollars to 6-zeros, such as the 3.5 million dollars claimed by

² BENJAMIN, B. Ferencz, „From Nuremberg to Rome: The Prosecution of International Crimes” 1998 <http://www.benferencz.org/arts/27.html> accessed la 16.02.2019.

³ Robert J. LIFTON, Destroying the World to Save It: Aum Shinrikyo, Apocalyptic Violence, and the New Global Terrorism (New York: Metropolitan Books, 2010, p10).

Somali pirates for the release of *Stella Maris* (2008). And Somali pirates who captured earlier this year the British ship "Asian Glory" (aboard two Romanian sailors) demanded a record \$ 15 million reward.

The approach to the phenomenon of piracy has to be done considering the stage of the threat at a low level, so that the response must be proportional to it (low intensity conflicts) on the part of the international community. According to author's opinion, „*it must be similar to the approach of an ongoing crisis, by observing the general laws of war in accordance with them*”⁴. The success of pirate attacks has been reduced for several reasons. First of all, the international military presence in the Indian Ocean has clearly intimidated these actions. The intervention of the Kenyan army led to a significant reduction in the force the pirates attacked. Special shipping in the region have security teams on board and are escorted by military frigates and airborne helicopters and airplanes.

Mandatory crossing points

In the age of globalization, oil transport is „strategically,”⁵ one of the most important resource movements. Since about two-thirds of the world's oil production is delivered at sea, there are some inherent constraints on distribution, which require strait navigation and passages – the so-called mandatory points of maritime traffic. Considering these aspects and the fact that the blocking of a mandatory, even temporary, point can lead to political tensions between international actors and substantial increases in total energy costs, a general presentation of these mandatory points is required (Hormuz, Suez, Danish Straits, Malacca, Bab el-Mandeb, Bosphore, Panama) as well as an analysis of their importance for the global economy and the geopolitical significance of the great powers. Energy-related issues occupy a central place in international relations, being part of the global challenges that increasingly require states and civil societies.

The 21st century is characterized by the increasing dependence of the world's economies on energy resources. The world economy still depends on oil as a central energy resource, and the struggle for resources dominates the geopolitics of the 21st century. In the age of globalization, oil transport is strategically one of the most important resource movements. Under these circumstances, mandatory points are of utmost importance, and great powers seek to ensure their security. Mandatory points are narrow channels along maritime routes widely used worldwide, some of which are so narrow that the restrictions relate to the size of the ship that can navigate through them. They are a critical part of global energy security because of the high volume of oil sold through their narrow straits.

For the great powers on the international scene, a binding point has a double meaning: it is seen as a resource due to three characteristics: physical characteristics - it is a location that forces traffic to converge and, by virtue of its physical characteristics, namely, the depth, breadth or navigation, limits the movement. Its physical capacity to fit maritime traffic is thus limited; use - the value of a vital point is proportional to its degree of use and the availability of alternatives.

The fact that a vital point behaves as a limit for circulation, imposes a threshold for its use. The more traffic is closer to this threshold, the more the resource is considered to be exhausted; access - as a valuable resource, a certain degree of control must be set up to ensure access to the mandatory pass. This requires agreements to regulate use and resolve disputes where access is challenged.

⁴ Scipanov, Lucian Valeriu, *PIRATERIA – între mit și realitate*, Editura Universității Naționale de Apărare „Carol I”, București, 2018, p. 63.

⁵ Președintele George W. BUSH “Remarks by the President Upon Arrival,” 16 September 2001; www.whitehouse.gov/news/releases/2001/09/20010916-2.html, accesat pe 16.02.2019.

Transit fees can also be levied if mandatory points fall within a defined jurisdiction, such as for locks and as an economic and political tool - who controls the mandatory points, controls the vast and most of the savings (1897) considered that one of the conditions required for the United States to dominate the world was to dominate the sea, and the domination of the sea required control of the compulsory and strait points as well as a good fleet).

Thus, ensuring the security of mandatory points is of utmost importance for international security, as the international energy market is dependent on safe transport. Blocking a mandatory, even temporary, point can lead to substantial increases in the total cost of energy. In addition, binding points leave oil vulnerable to pirates theft, terrorist attacks, and political turmoil in the form of wars or hostilities, as well as to shipping accidents that can lead to disastrous oil spills.

Under such circumstances, oil remains the most important strategic product in the period ahead, making it subject to geopolitical conflicts of access, control and distribution, and the global economy will remain dependent and vulnerable to its circulation, especially through these binding points. Many of the straits do not have enough commercial shipping and shipping to be considered of strategic importance at a global level. But there are at least eight busy straits and channels that are geographically mandatory crossing points. These "maritime bottlenecks"⁶ are in the Middle East, Asia, Europe, Africa and the Americas.

These include⁷:

1) The Hormuz Strait that passes from the Persian Gulf to the Arabian Sea and the Indian Ocean;

2) The Malacca Strait and Singapore (in Southeast Asia) connect the Indian Ocean with the Pacific Ocean via the Andaman Sea and the South Sea of China;

3) The Panama Canal that provides a short cut between the Pacific Ocean and the Atlantic;

4) The Bab el-Mandab Passage linking the Arabian Sea and the Aden Gulf of the Red Sea;

5) Suez Canal between the Red Sea and the Mediterranean Sea;

6) Turkish Straits linking the Black Sea and the Mediterranean;

7) The Gibraltar Strait between the Mediterranean Sea and the Atlantic Ocean;

8) The Danish Straits are three channels linking the Baltic Sea to the North Sea through the Kattegat and the Skagerrak.

A common feature of all these waterways is that they have a width of less than 40 km at their narrowest point. The waterways of some of the straits, including the Malacca and Singapore strata, narrow in one or more portions less than a few miles.

All of these channels are particularly important for world trade and circulation. However, they are quite narrow to be closed for a period of shipping because of an accident or an attack. One of the eight mandatory points, the Strait of Hormuz, is the only way out and from the Persian Gulf to the sea. The other could be bypassed, though it would often involve a rather long bypass for ships. This would disturb the naval deployments. It would also add time and cost to global trading and to the business network now depends very much on keeping the stocks low and the goods delivered on time and in sufficient quantity.

The link between piracy and the political-military domain has been observed since ancient times to the present. In this context, Dr. Scipanov Lucian *identified two relationships born out of the polemic of the relationship between piracy and political-military manifestation. The first stage is convergent, which led to the development of piracy from the form of armed robbery between kingdoms, empires and medieval states through corsairs and*

⁶ Lifton, Robert J., *Destroying the World to Save It: Aum Shinrikyo, Apocalyptic Violence, and the New Global Terrorism*, New York: Metropolitan Books, 1999, p. 16.

⁷ *Ibidem*, p. 14.

*mercenaries. The second, divergent relationship, born out of the need to eradicate the phenomenon, manifested through local actions, by regional operations of the nature of the low intensity, by the use of the gradual force in correlation with the effort of the international organizations to fight piracy.*⁸

Compulsory crossing points – a general view

Mandatory points are geographically true Achilles' heel of the global economy. The geostrategy of oil transit routes involves at least eight mandatory points, the most important being Hormuz and Malacca, as they account for more than 60% of oil transit. – The Hormuz Strait – is a very important vital point in the Persian Gulf. In 2018, nearly 17 million barrels of oil have gone through this key energy route. It is located strategically between Iran and Oman, giving Iran the opportunity to influence global economies. According to US sources, "the flows that went through straits in 2018 accounted for about 35% of oil transactions at sea, or about 20% of oil traded globally."⁹

On average, almost 14 oil-fueled oil tankers pass through the Hormuz Strait daily. Countries like Japan, India, South Korea, China are largely dependent on this energy route, with almost 85% of these gross oil exports destined for these countries. Closing this energy route would have a serious impact on the world's it requires the use of longer alternative routes and high transport costs.

Alternative routes would include 745 miles along Petrolina, one of which, known as the East-West pipeline, along Saudi Arabia from Abqaiq to the Red Sea. Another option could be the Iraq-Turkey pipeline at Ceyhan Port of the Mediterranean, and the United Arab Emirates that also feeds 1.5 million barrels of crude oil on the Abu Dhabi ziconduct. But despite these energy routes, the importance of the Hormuz Strait can never be diminished. It will remain an important crossing point in the region.

The Malacca Strait located between Indonesia, Malaysia and Singapore, links the Indian Ocean to the South of China and the Pacific Ocean. Malacca is the shortest maritime route between China, Japan, South Korea and the Pacific Coast. The oil tankers supply, through the Malacca Strait, China and Indonesia, two of the rapidly growing world economies. It is the key Asian key point with an estimated 13.6 million barrels of oil per day. At the narrowest point of the Phillips Channel in the Strait of Singapore, Malacca is 1.7 miles wide, creating a natural jam, as well as a potential for collisions, stumbling or oil spills. According to the International Maritime Bureau, the Piracy Prevention Center, piracy, including attempted theft and diversion, is a constant threat to Malacca Strait, although the number of attacks has decreased due to the increased number of patrols on the seashore belonging to state authorities, issued since July 2005. More than 60,000 ships per year transit through the Strait of Malacca.

If the Strait were to block, about half of the world fleet would have to bypass the Indonesian archipelago through the Lombok Strait, located between the Bali and Lombok Islands, or the Sunda Strait located between Java and Sumatra. There have been several proposals to build bypass roads to reduce oil traffic through the Malacca Strait. Construction began in 2009 to build a pipeline for a transit of 240,000 barrels of oil per day from Myanmar to China, which eventually could be expanded.

The Suez Canal is located in Egypt and connects the Red Sea, the Suez Bay and the Mediterranean Sea to a stretch of 120 miles. Oil (crude and crude oil as well as refined products as liquefied natural gas represent between 13 and 11 percent of freight, measured in freight tonnage). The total oil transit volume was close to 2 million barrels of oil per day , or

⁸ Scipanov, Lucian Valeriu, *op.cit.*, p. 64.

⁹ Robert J. Lifton, *op. cit.*, p. 19.

about five percent of the maritime trade in 2018. Approximately 16,500 ships crossed the Suez Channel from January to November 2018, of which 20% were oil and 5% liquefied natural gas. The channel is not capable of supporting Very Large Crude Carriers (VLCC) and Ultra Large Crude Carriers (ULCC). The Authority of the Suez Canal continues channel improvement and expansion projects, and expanded the depth to 66 feet in 2010 to allow about 60% of tankers to use the Channel. Closing the Suez Canal or the SUMED pipeline could divert oil tanks around South Africa's Cape of Good Hope by adding about 6,000 miles to transit, increasing both shipping costs and shipping time. According to a report published by the International Energy Agency (AIE), maritime shipping around Africa would add 15 days to Europe's transit and 8-10 to the United States.

The Bab el-Mandeb Strait is a crossing point between the horn of Africa and the Middle East and a strategic link between the Mediterranean Sea and the Indian Ocean. It is located between Yemen, Djibouti and Eritrea and links the Red Sea to the Gulf of Aden and the Arabian Sea. Most exports from the Persian Gulf through the Suez Canal and the SUMED pipeline also cross the Bab el-Mandeb Strait. A projected flow of 3.2 million barrels per day has gone through this sea route to Europe, the US and Asia. The majority of traffic, around 1.8 million barrels of oil per day, moved northward through Bab el-Mandeb on his way to the Suez/SUMED complex. Bab el-Mandeb is 18 miles wide at its narrowest point, hindering the circulation of oil tanks and limited to two two-mile wide channels for inbound and outbound transport. Closing the straits would prevent Persian Gulf oil tanks from reaching the Suez Canal or the SUMED pipeline, hijacking them around the southern tip of Africa. This would effectively affect the reserve capacity of the oil tanker and increase the cost and transit time. The Elb-Mandeb Strait could be bypassed by the East West gas pipeline, which crosses the Suez Canal of Saudi Arabia, with the exception of limited trade within the Red Sea region, at a nominal capacity of 4.8 million barrels per day. However, oil transport on the southern side would still be blocked. In addition, the Bab el-Mandeb closure would block non-oil shipping from its use, with security being the main concern of companies doing business in the region after a French oil tanker was attacked by terrorists on the Yemeni coast in October 2002. In recent years, this region has witnessed an increase in piracy, and Somali pirates continue to attack ships in the north of the Somali coast in the Gulf of Aden and the South of the Red Sea, including Bab el-Mandeb.

The Bosphorus and Dardanelles comprise the Turkish straits that divide Asia from Europe. The Bosphorus binds the Black Sea to the Marmara Sea, and the Dardanelles bind the Marmara Sea to the Aegean and Mediterranean Sea. The 17-mile long maritime route in Turkey supplies Western and Southern Europe with oil from the Caspian Sea region. A projected flow of 2.9 million barrels of oil per day passed through these straits in 2018, of which 2.5 million barrels of oil per day were crude oil. The Black Sea ports are one of the primary export routes for Russia and other republics of the former Soviet Union.

Transit through the straits grew again as production and exports from Azerbaijan and Kazakhstan increased. Half a mile wide at the narrowest point, the Turkish Straits are one of the most difficult maritime routes to navigate due to their sinuous geography. With 50,000 vessels, including 5,500 oil tanks passing through straits each year, they remain one of the most crowded bindings. Turkey has been worried about the security of navigation and environmental threats to the straits. Commercial shipping has the right to free passage through the Bosphorus Strait in peacetime, though Turkey advocates the right to enforce regulations to ensure safety and the environment. Barriers and heavy traffic also pose problems for oil tankers in the Bosphorus Strait. Although there are currently no alternative routes for Western shipping in the Black Sea and Caspian regions, there are still many ongoing pipeline projects in different phases of evolution.

Gibraltar Strait – Gibraltar is the world's smallest non-land territory of 6.5 km², located on a rocky peninsula in the south of the Iberian Peninsula. The Gibraltar Strait divides Europe from Africa and has a length of 14 km. More than 106,000 ships, 5000 of them - 10% of world traffic - cross the Gibraltar Strait every year.

The Panama Canal is an important route linking the Pacific Ocean to the Caribbean Sea and the Atlantic Ocean. The canal is 50 miles long and only 110 feet wide at the narrowest point called the Culebra Cut on the Mainland. Approximately 14,000 vessels transit the annual Channel, of which more than 60% (tons) are for transportation to and from the US. Closing the Panama Channel would increase the time and cost of transport by adding 8,000 miles to travel. The vessels should bypass the Magellan Strait, the Horn Head, and the Drake passage across South America. However, the Panama Canal is not a significant sea route for oil or US oil imports. Approximately one fifth of the transport on this channel (measured both in transit and tons) was oil tankers. According to the Panama Canal Authority, 0.8 million barrels per day of crude oil and petroleum products were transported through the canal, of which 620,000 barrels per day were refined and the remainder was crude oil. Crude oil is transported from North (Atlantic) to South (Pacific). However, the relevance of the Panama Canal for global oil trade has diminished as most oil tankers are too big to cross the channel. Certain oil tanks, such as Ultra Large Crude Carriers (ULCC), may be five times the maximum capacity of the channel. The largest vessel that can transit the Panama Canal is known as the PANAMAX vessel (ship ranging from 50,000 to 80,000 tons in weight and width of 108 feet). To make the channel more accessible, the Panama Canal Authority has begun a vast widening program to be completed in 2014. However, although some larger tankers will be able to transit the canal after 2014, some ultra-large conveyers will remain incapable of transit.

The Danish Straits - an estimated 3.3 million barrel / day flow has gone on this sea route, scaling the European markets. Russia has switched to higher oil exports from Baltic ports, especially from the newly built port of Primorsk, which accounted for half of the exports through these straits. To this, there is added 0.3 million barrels per day of crude oil from Norway to Scandinavian markets. Approximately one third of exports to the West through the Danish Straits are for refined products coming from Baltic Sea ports such as Tallinn (Muuga), Venstpils, and St. Petersburg.

The International Maritime Bureau (IMB) defined piracy as *"the act of kidnapping or attempted abduction of a ship with the intention of committing a theft or any other criminal activity through the use of violence."*

Action by the naval forces against piracy in international waters never ceased. Piracy, in addition to the geopolitical effects it causes, from the perspective of international law, can be considered as a social practice in terms of the processes that determine it. The phenomenon of piracy, as a social practice, derives from the material and ideological constraints as the existential, structural, and spiritual dimensions of the individual. Piracy has been and continues to be a process of social interaction with implications stemming from general polemics, transforming into tensions or conflicts that create acts of violence or political dissent. The effect it generates involves the intervention of the international community. The intervention of the international community is the response to violence, with military actions of a hard type, according to the general laws of the war, but may also be in the form of a non-military intervention as a soft measure (humanitarian aid). This aspect can be established by integrating all the maritime disarmament functions of the institutions and agencies of the respective countries, but there have been situations when multinational forces have been designated for the execution of large-scale actions under UN international mandate. As a first measure to prevent piracy, the International Maritime Bureau recommends that ships transiting the Gulf of Aden do not approach the Somali coasts less than 500 miles away.

International bodies, such as NATO and the European Union, have taken the most drastic measures against piracy, diluting naval forces in the Gulf of Aden and the Somali coast. In 2008, NATO launched the Ocean Provider mission, which later became Ocean Shield. Global security is considered to be affected by five major risks: increased instability, proliferation of weapons of mass destruction, increased numbers of states in crisis, multiplication of terrorist and pirate acts, and increased migratory flows and refugees.

In the opinion of Dr. Scipanov Lucian, *these risks are not generalized and manifest differently in areas where favorable factors exist, so I think they are rather regional risks with global influences. Factors favoring the emergence of phenomena arising from the manifestation of major risks may be of a political, military, economic, social and religious nature*¹⁰. By this, I consider that the author has noticed the risk factors generating crises from piracy and that can degenerate into conflicts.

Piracy is in NATO's attention after the events of September 11, 2001 in the US, capitalizing on the lessons learned from Operation Active Endeavor, launched in 2001. It aimed at combating terrorism, preventing terrorist acts and identifying the risks of this phenomenon in the Mediterranean. It appears that during the operation, some of the terrorist attacks were identified even by the pirates, backed by terrorist organizations. That is why the phenomenon is a factor of concern to the Allies, even if the indices of manifestation are identified in areas peripheral to NATO borders. The Allied Protector¹¹ maritime operation was aimed at supporting the international effort against piracy in the Gulf of Aden and the Horn of Africa. During the operation, ships from NATO, SNMG1¹² and SNMG2¹³ participated.

Conclusions

In conclusion, it can be said that globalization is characterized by energy dependence, where oil remains the most strategic asset of states. Meanwhile, in an insecure and vulnerable era, where oil traffic growth is predicted, strategic binding points are strongly affected by tension.

In close connection with this, oil transport needs special attention, and mandatory points, seen as narrow channels that are widely used along global maritime routes and implicitly as a critical part of global energy security due to the high volume of oil sold through them, need to be secure.¹⁴ They are both a resource and a political tool, the great powers using them to dominate international relations, as who controls the binding points will control the sea of the globe and who controls the sea of the world can dominate the world.

At the request of political decision-makers, based on international agreements, military ships organized in Task Groups under the command of Task Force participate in the maritime security mission at mandatory crossing points.

In the Black Sea, the phenomenon of piracy is not generalized and does not know a manifestation like in other parts of the globe. However, if we look at the existence of risks that can cause such a phenomenon, it can be considered that piracy is still topical, so the aspect is permanently in the attention of the Black Sea riparian states. We note that there are concerns to eliminate any risk of this phenomenon, including some of the most visible: there are institutions to monitor the phenomenon of piracy; combating piracy is a mission mentioned in most of the shipwreck forces of the Black Sea fleets.

¹⁰ Scipanov, Lucian Valeriu, *op.cit.*, p. 72.

¹¹ Operația Allied Protector – desfășurată în perioada 24.03-29.06.2009, the author note.

¹² Comandă portugheză, contraamiral Jose Pereira de Cunha; participare: Portugalia, Canada, Olanda, Spania, SUA, the author note.

¹³ Comandă britanică, căpitan Steve Chick; participare: Grecia, Italia, Turcia, Marea Britanie, SUA, the author note.

¹⁴ Popescu, Ilie, *Terorismul internațional- flagel al lumii contemporane*, Ed. M.A.I., București, 2003.

For Romania, the issue of piracy in the Somali coast is a national concern because, as a member country of the European Union, it can not be passive to this global threat. Another reason to be involved in the fight against piracy is the large number of Romanian sailors who have to navigate the seas and oceans of the world without being threatened by the pirate phenomenon.

The presence of clusters of ships to ensure the safety of maritime traffic in areas at high risk of piracy is necessary not only for deterrence but also for timely and effective action. It is also necessary to revise the treaties, the piracy laws, and so far lagoons in the arrest and detention of pirates as well as their surrender to the competent authorities for their trial and conviction.

In this article, I believe that we have highlighted the importance of active naval presence in high risk areas of asymmetric threats, the effectiveness of cooperation in anti-piracy operations, the need to harmonize national legislation with specific regulations for detaining, transferring, judging and condemning pirates.

The protection of commercial routes is an international challenge, which has been perpetuated since antiquity and nowadays relies on international cooperation, scientific breakthroughs and revolutionary technology.

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BUILDING THE CREDIT HOLDERS' BUDGETS IN THE NATIONAL MINISTRY OF DEFENSE, IN COMPLIANCE WITH THE PLANNING, PROGRAMMING, BUDGETING AND EVALUATION SYSTEM

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Abstract:

Inside the Ministry of National Defense, constructing and estimating a credit holder's budget, regardless of its category (primary, secondary or tertiary) is a laborious process, which is based on a number of programmatic documents, such as National Strategy of Defense, departmental documents - White Paper of Defense, Military Strategy, Defense Planning Guidance (DPG), including the state budget law and specific legislation, such as rules of procurement, consumption regulations etc. The budget is the transposition into financial resources of all the measures and activities undertaken to carry out the missions and the achievement of the objectives assumed for that respective period of time.

In this paper, we are exposing the need to implement a coherent planning system and how it works, the involvement and interaction of both the top political factors (president, parliament and government) and military decision-makers, and we will detail the functional phases of the planning system, focusing on the budgeting process.

Keywords: *planning; programming; budgeting; evaluation; budget.*

1. Introduction

After the Revolution of December 1989, like the other ex-communist states that were members of the Warsaw Treaty, Romania had a rigid defense planning system, characterized by an excessive centralization, specific to the Cold War. Military equipment, largely Eastern production, was not compatible with those of NATO member states, being physically and morally outdated. The army was oversized, heavily reacting to change, and with great difficulty managed to adapt and act appropriately to the risks and threats of a political and strategic environment in a continuous dynamics. The military structures did not meet NATO standards in terms of operability, and the concepts and visions of the role of the Army and how it should be used were not in line with Alliance concepts.

Starting from these realities, Romania has made special efforts and made significant progress in reforming the Army, in developing and implementing a planning system compatible with that of NATO. Efforts to develop a coherent defense planning and defense resource management system have effectively matched Romania's accession to NATO.

Over several years and in accordance with its status in relation to the North Atlantic Alliance, Romania had several normative acts that enacted the Defense Planning: Government Ordinance no. 52/1998 on Romania's National Defense Planning, Law 63 of 2000, Law 473 of 2004. At present, Defense Planning is regulated by Law 203/2015 on Defense Planning,

adopted by the Romanian Parliament and published in the Monitorul Oficial, Part I no. 555 of July 27, 2015.

Within NATO, the planning system aims a unitary development of the Alliance's military capabilities to meet interoperability requirements, in terms of military technology and equipment, and in terms of procedures and modalities of action. As part of the planning process, regular consultations take place to harmonize national defense plans and policies with the alliance's requirements.

The implementation of the planning system aims to integrate the efforts of the structures of the Ministry of National Defense to achieve the planned military capabilities, using at maximum efficiency the available resources. The planning system, as it is enacted, provides an enhanced role for civil democratic control over the formulation and implementation of defense policies. It has the following features: it is a centralized, "up-down/top-down" process; entails delegating responsibility for program development, implementation and execution to the major program managers, within the limits of the allocated financial resources; involves resource competition; allows corrections during the processes due to insufficient or delayed allocation of estimated financial resources; is a flexible process.

The system includes a set of measures and actions designed at establishing, monitoring and evaluating the results of military capabilities activities that are capable of fulfilling the missions and objectives set in accordance with the resources at its disposal. The requirements faced by the planning system have led to a cyclical system with distinct and interdependent phases.

The stages/phases of the Planning, Programming, Budgeting and Evaluation (PPBES)¹ system are interrelated and we can assume that they are defined by the answers to the questions:

- PLANNING = what are the military requirements for defense?
- PROGRAMMING = what capabilities are scheduled for the next 10 years to meet defense security objectives?
- BUDGET = what financial resources are needed for the first year of the program?
- EVALUATION = are the planned objectives achieved?

2. Planning, Programming, Budgeting and Evaluation System in the Romanian Ministry of National Defense

In the Romanian Ministry of National Defense, the implementation of the Planning, Programming, Budgeting and Evaluation System has been done with the support of American experts at the Institute for Defense Studies since the second half of the 1990s.

PPBES is built on the US Model PPBES (Planning, Programming, Budgeting and Evaluating System) and uses the same planning steps.

The elements of the system are:

PLANNING: is the process of assessing security needs and determining the military requirements deriving from them.

PROGRAMMING: At this stage, military capabilities are transformed into capabilities.

BUDGET: transformation of defense programs into the specific allocation of financial resources in accordance with the imposed constraints, the financial requirements necessary to support the approved programs are established, the results of the planning and programming phases are transformed into annual financing requirements and the budget proposals for the Ministry of National Defense are submitted.

EVALUATION is the phase in which is performed the analysis of the obtained results, the comparison of the planned parameters with the obtained ones, the application of corrections and analyzes and studies for the future.

¹ Course Notes – Univ. As. Maria Constantinescu, DRESMARA, Braşov.

2.1. PLANNING phase

Defense planning, as defined in Defense Planning Law 203/2015, is "an essential attribute and component of defense policy" and "is a complex of activities and measures aimed at protecting and promoting national interests, defining and achieving national security objectives of Romania in the domain of defense."²

"The defense planning is based on the decisions of the President of Romania and the Government of Romania, with the approval of the CSDC (Country's Supreme Defense Council), according to the law, and with the approval of the Parliament, as the case may be, as well as of the measures and actions taken at the level of the other public institutions which have responsibilities in the domain of defense, according to the law."³

Defense planning activity is a complex process underlying the transformation and modernization in the domain of defense and includes the programs, actions and measures taken by Romania in the domain of security and defense in order to fulfill the obligations deriving from the Constitution, as well as to fulfill the assumed obligations towards the allied and partner states and the organizations it is part of.

The process of democratic civilian defense control is based on the coordination of the entire planning activity of this domain.

By level, the main documents underpinning defense planning are at national and departmental levels. National documents are the National Country Defense Strategy and the Governance Program, and the departmental documents are the White Paper of Defense, Defense Planning Guidance (DPG), Major Programs and Annual Plans.

The document underlying the national defense planning is the National Defense Strategy of the country, it has a 5 year horizon, as well as medium and long term provisions. This document is drafted by the president and includes national interests and security objectives, international security assessments, identifying internal and international risk factors, defense objectives and priorities, ways to act and ways to ensure national security in the domain of defense .

In order to implement the provisions of the National Defense Strategy and the objectives under the Government Program, the Government, through the Ministry of Defense, develops the White Paper of Defense, a document with a 4-year coverage and medium term provisions, which sets out: the objectives of the defense policy and the measures taken to meet them, the specific missions and requirements for the Romanian Armed Forces, the integrated defense resource management, the capabilities development directions and the resources allocated to it.

Based on the National Defense Strategy, the White Paper of Defense and relevant documents at NATO and EU level, the Ministry of National Defense elaborates the Military Strategy, document with a 4-year horizon, comprising: identified risks and threats, military objectives national defense capabilities and their prioritization, force structure, configuration, sizing, training and endowment of the Romanian Armed Forces as well as operational concepts established for the fulfillment of its objectives and missions.

Annually, after receiving the framework letter on the macroeconomic context and spending limit approved by the Government (projected 2% of GDP, in line with national commitments to NATO), the Defense Ministry is developing Defense Planning Guidance (DPG). The Defense Planning Guidance defines the general objectives and priorities of the Ministry of National Defense, the major programs and their directors, the objectives and capabilities of each major program, as well as their budget projections.

² Defense Planning Law 203/2015.

³ Defense Planning Law 203/2015 – Article 3 para (4).

Defense Planning Guidance is a document that is one of the foundations of integrated planning at the Ministry of National Defense.

The Guidance establishes the necessary framework for the development of planning documents and at the same time draws the necessary directions for the major program directors to adopt the best courses of action in order to achieve the specific objectives.

The document is the main basis for harmonization between policies, resources and capabilities. The Guidance provides a common vision of objectives and priorities in resource allocation, establishes connections with the Alliance's planning system, generating specific targeting in each of the defense planning areas.

Defense Planning Guidance is being developed / reviewed annually and has a 10-year horizon.

A synthetic diagram of programmatic documents is shown in Figure no. 1.

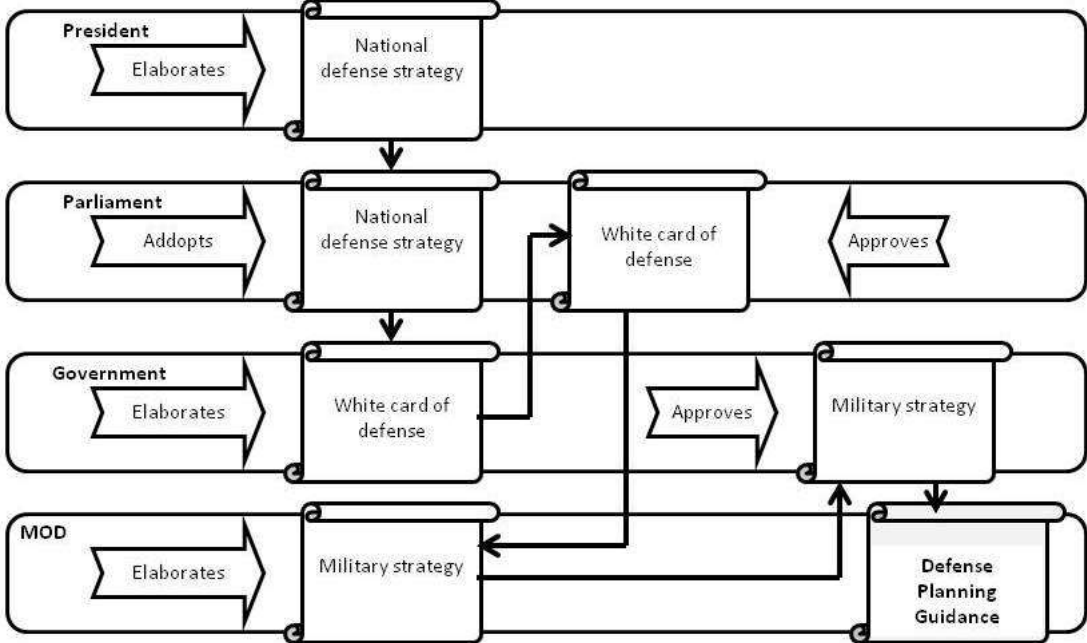


Figure no.1. Stages of the defense planning system, which results in Defense Planning Guidance (DPG)⁴

The outcome of the planning phase is represented by Defense Planning Guidance. Defense Planning Guidance sets out general objectives, specific objectives and defense priorities as well as the budget projections allocated to them.

2.2. PROGRAMMING phase

At the Programming phase, the results of the previous planning phase, respectively the Defense Planning Guidance and other planning documents, are transformed into achievable targets by allocating the appropriate resources.

At this stage, depending on the priorities and objectives to be achieved within the established timeframe, is made the distribution / allocation of resources between the major programs. The detailed plans are now being developed in terms of force structure, forecasted capabilities, training and combat capabilities, all in line with the resources needed to implement them. The outcome of the programming phase are the major programs, within the required financial limits and meeting the objectives defined in the planning phase. The main documents drawn up are the Major Programs and the Annual Plans.

⁴ Course Notes – Univ. As. Maria Constantinescu, DRESMARA, Braşov.

During the programming process, various alternatives are being developed to reach the DPG objectives, with respect to funding limits. The major program is the tool that allows policy-makers to choose the right alternative and is the basis for budgeting.

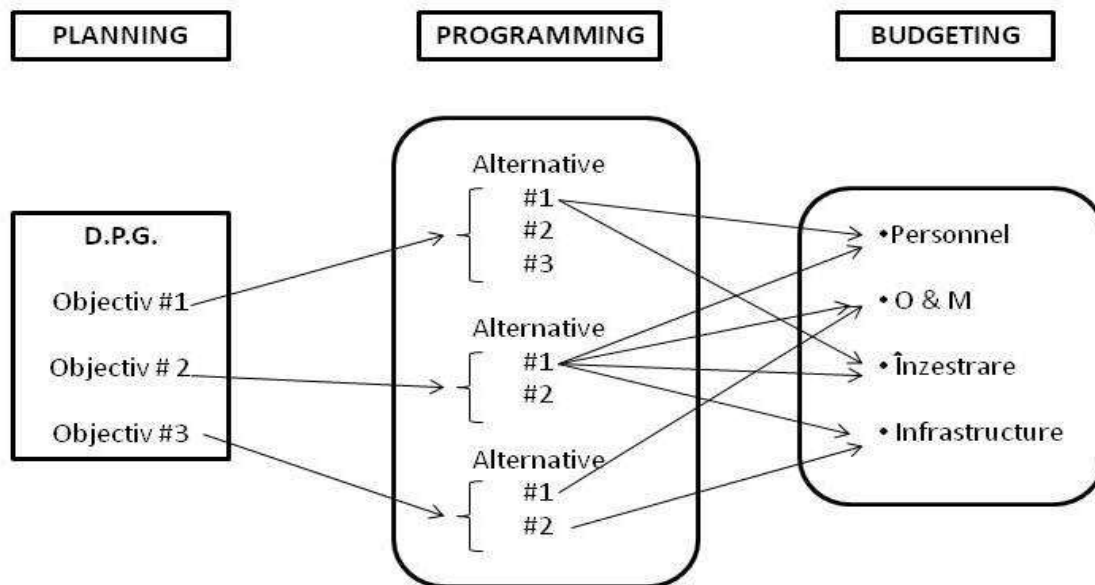


Figure no. 2. Converting Objectives into Capabilities⁵

The design and execution of major programs are under the responsibility of major program directors. The senior program director is the head of an institution, usually a secondary credit holder, to whom the necessary resources are allocated and the specific objectives to be achieved and the responsibility for setting up, developing and maintaining capabilities.

Major programs, developed and / or reviewed annually over a 10-year horizon, include measures and actions to modernize, equip, train, prepare for participation in missions outside the national territory, crisis and warfare preparedness, include measures and actions to ensure the living conditions of personel, logistical support and infrastructure, resources annually allocated for this purpose.

If there is a flagrant discrepancy between the objectives and the allocated resources, the major programs are accompanied by documents detailing the identified problems. Following an analysis to clarify and appraise them at expert level, the remaining issues are submitted to the Defense Planning Council for a final decision in order to resolve them.

The major programs of the National Defense Ministry⁶ are: Land Forces, Air Force, Naval Forces, Logistic Support, Defense Forces/Strategic Leadership, Central Administration, Defense Information, International Representation".

The major program directors, on the basis of major programs and allocated resources, draw up their annual plans.

2.3. BUDGETING phase

Program budgeting is based on the allocation of budget resources in programs, according to planning and prioritization, highlighting the connections between the financial resources and the results to be achieved (expected).

This phase aims to establish a viable financial plan that will provide the resources needed to achieve and maintain the capabilities foreseen in the first year of the program, in line with the annual plan drawn up.

⁵ Course Notes – Univ. As. Maria Constantinescu, DRESMARA, Braşov.

⁶ Defense Planning Law 203/2015.

Over the budgeting stage, the objectives to be pursued can be synthesized by the answers to the following questions:

- Does the budget reflect the priorities of the Ministry of National Defense?
- Does the budget reflect the provisions of the planning documents?
- Have the major programs provided the financial resources needed to achieve the objectives?

The main documents elaborated in this phase are: the draft of the Ministry of National Defense's budget and the substantiating annexes, the Ministry of National Defense's budget (approved by the Parliament) and the budgets of the secondary creditors.

2.4. EVALUATION Phase

Evaluation is not only a distinct phase of the process, although it is foreseen after the budgeting phase, but it is a continuous process that needs to intervene and apply the necessary corrections in all PPBES's phases.

At this phase the mode and the stage of implementation of the planned and established objectives are determined, for which the estimated financial resources have been allocated. Following the process of assessing how to achieve the planned PPBES objectives, the necessary adjustments for the next cycle can be made.

In order to assess the state of development of the major programs and the fulfillment of the annual plans, major program directors prepare regular reports on the basis of which the Ministry of National Defense presents to the CSDC (Country's Supreme Defense Council) an information regarding the stage of achieving the objectives and priorities established by the Directive of Defense Planning.

The monitoring of the medium and long-term program stage and the monitoring of the annual plans are in the attributes of the planning structures within the Ministry of National Defense, and the major program directors are responsible for the execution.

The modalities of elaboration, coordination, execution, monitoring and reporting of the state of fulfillment of the provisions of the Planning Directives are regulated by minister's orders.

3. Budget elaboration

Costs by objectives (established by passing through the steps / phases of the PPBES cycle), activities, missions, nature of expenditures are framed and grouped into the structure of the budget classification, resulting in the budget projection / financial resource corresponding to the major program, all of which will be the basis drafting the annual draft budget.

The annual program expenditure proposals shall be drawn up in accordance with the law on public finances and with the provisions of other specific normative acts, and shall be transmitted to the Chief Authorizing Officer who analyzes, centralizes and elaborates the budget of the Ministry of National Defense.

In most cases, each subprogram or subprogram item corresponds to a tertiary credit holder. How to convert a program's budget into a budget is illustrated in Figure no. 3.

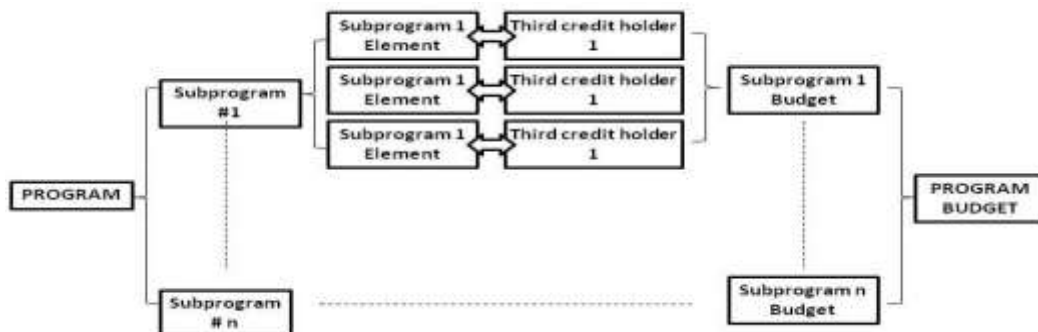


Figure no. 3. Transforming the program's elements of a into the budget⁷

⁷ Course Notes – Univ. As. Maria Constantinescu, DRESMARA, Braşov.

The method of converting the elements of the sub-programs into cost elements which, together, represents the budget of the annual plan for the major program, is presented in figure no. 4.

The budget of the main credit holder consists of its own budget and the sum of the budgets of subordinate secondary and tertiary credit holders. In turn, the budgets of the secondary credit holders are made up of their own budgets, necessary for operation and development, plus the sum of subordinate tertiary credit holder's budgets.

The budgets of the credit holders are organized by sources, chapters, subchapters and budget articles, in accordance with Law 500 of 11 July 2002 on public finances, with subsequent amendments and completions:

"Art. 29. – (1) Revenue and expenditure shall be budgeted on the basis of the budget classification.

(2) Revenues are structured by chapters and sub-chapters, and expenditure on parts, chapters, subchapters, headings, articles, and paragraphs, as the case may be.

(3) Expenditure provided in the chapters and articles has a precise and limited destination.

(4) The number of employees, permanent and temporary, and the basic salary fund shall be approved separately, by appendix to the budget of each main authorizing officer. The number of employees approved for each public institution can not be exceeded.

(5) Capital expenditures shall be included in each budget chapter, in accordance with the commitment appropriations and the duration of the investments.

6. The programs shall be approved as annexes to the budgets of the main credit holders."⁸

Most often, the need for budget funds/credits determined by calculations that take into account all the cost elements of the sub-programs exceeds the expenditure limits communicated by the Ministry of Finance. Compliance with these limits requires a thorough analysis of the activities / expenditures / costs that result in their prioritization. The activities / cost elements are analyzed and their impact is taken into account so as to achieve the objectives assumed in the annual plans by meeting the required expenditure limits and making the most of the resources available. As we have shown above, the necessary corrective / harmonization measures are taken from the planning stage if there is a flagrant discrepancy between the objectives and the allocated resources.

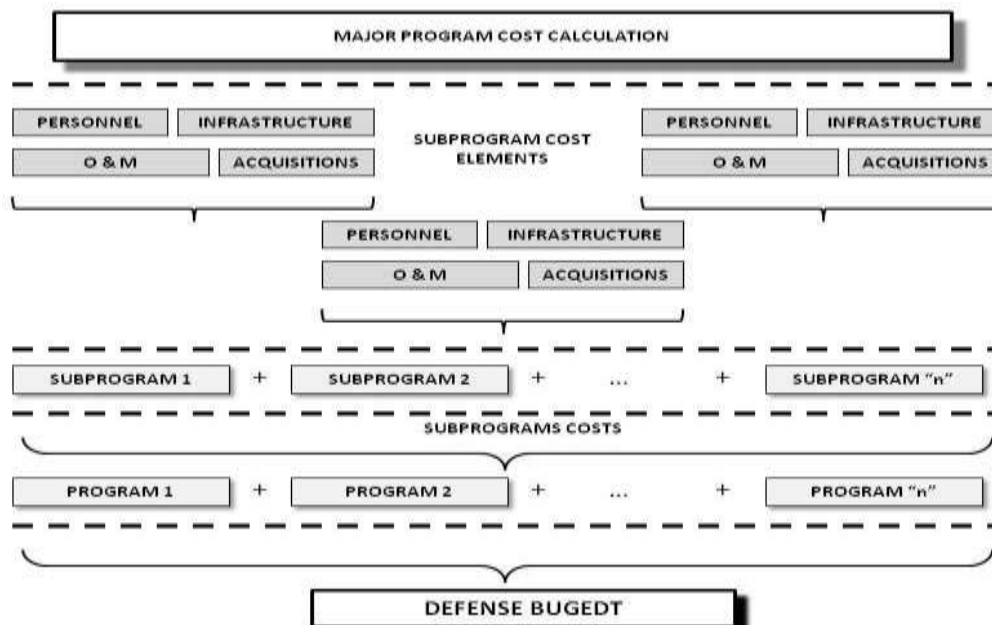


Figure no. 4. Budgeting based on cost elements / subprograms⁹

⁸ Law 500/2002 on public finances.

⁹ Course Notes – Univ. As. Maria Constantinescu, DRESMARA, Braşov.

The calendar for elaborating the draft of budgets is established by the legal framework:

"Article 34. – (1) The main authorizing officers shall be obliged to submit to the Ministry of Public Finance, by 15 July of each year, the proposals for the draft budget and its annexes for the next budget year, within the limits of the expenditures, and estimates for the next 3 years, ..., accompanied by detailed documentation and substantiation.

(5) The draft budgets and the annexes thereto, ..., shall be submitted to the Ministry of Public Finance by 1 August of each year. "¹⁰

The budget implementation process aims at implementing the objectives foreseen for the current year of the program, based on the need for resources substantiated in the previous year in the budgeting phase.

4. Conclusions

During the process of the Army restructuring, transformation and modernization, defense planning has been a constant priority, and PPBES was a tool underlying the decision-making process on defense, respectively development and budget management.

The budget is the financial instrument that makes it possible to put into practice the objectives and capabilities established in the planning phase. There must be a correlation between the level of objective's ambition and the desired capabilities and the resources at its disposal, or in other words, the objectives and capabilities that we have to establish must be realistic, taking into account Romanian's economic possibilities.

Romania is in the process of developing the defense capabilities needed to meet international commitments and national defense, and the key to transforming and modernizing the Army is to efficiently allocate financial resources through a coherent and predictable budgeting process.

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Course Notes – Univ. As. Maria Constantinescu, DRESMARA, Braşov.

¹⁰ Law 500/2002 on public finances.

LEGISLATIVE FRAMEWORK ON NATIONAL PROGRAMS FOR THE TERRITORIAL DEFENCE PREPARATION

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Abstract:

Within this approach, I intend to emphasize the need to develop a legislative framework to support some national initiatives for the development of littoral construction projects, which by their purpose meet the requirements of several beneficiaries. The importance of territorial planning program amplifies the opportunity of the legislative optimization process through which projects can be launched to provide benefits to multiple domains, the military domain being one of them. Following the evolution of national programs developed at the littoral, I believe that those specifications of the territorial planning program, which, through minimal intervention, also serve the military domain, can be identified.

Keywords: *landscaping; Romanian littoral; legislative framework; national projects and programs.*

The economic and military domains are two areas of interest regarding the optimization of the legislative framework for the development of national and community territorial planning programs. That is why, in this approach, I have decided to identify those national initiatives and programs that, through purpose which they serve, it can respond to the proposed constructive solutions to the needs of several beneficiaries. Thus, I intend to identify those legislative measures that allow the use of national or structural funds which, through by optimizing their use, can also contribute to the fulfillment of national security specifications that serve more beneficiaries.

Taking into account the national interest in ensuring of a good financial management in the use of public funds, which corresponds to the purpose for which they were achieved, I think it is appropriate to identify those optimal conditions that will benefit many end-users. The conditions identified must be based on criteria to ensure the effectiveness and efficiency of the use of public funds to facilitate the delivery of quality and sustainable public investment and require minimal maintenance and repair costs during the operating period.

To achieve these objectives, the initiators of development programs should take into account that the main EU-funded projects and programs target the following areas: regional and urban development; employment and social inclusion; maritime and fisheries policies; research and innovation.¹

To achieve the goal of this approach, I will consider three objectives that, through descriptive, predictive and causal knowledge, support research. The first objective is to analyze the legislative and institutional framework that initiates, develops and implements projects that correspond to the proposed goal. Another objective is to identify projects for the creation of littoral facilities and how they have influenced the evolution of the beneficiary domains. The third

¹ https://europa.eu/european-union/about-eu/funding-grants_ro, accessed at 15.12.2018.

objective is to identify ways to optimize the territorial planning projects in the littoral area, targeting different areas of interest through common investment and reduced costs.

The research methods used are the cognitive-structural method through documentary, legislative and institutional analysis and the method of interpretive-referential research by observing the evolution of the areas of interest, following the application of the programs for the development of the littoral area and the forecasting of some evolutions of the effects they produce mentioned initiatives.

When I chose to do this approach, I took into account that the construction industry sector is considered at European level as a competitive sector that brings many benefits to society and the economy. In this respect, I believe that at the national level, the economic domain must be related to environmental protection policies, energy efficiency, citizens' safety and security, taxation, or public procurement, which implies the need to take measures to stimulate it. By this approach, the premises of the development of the domains with which it interferes are created, one of the beneficiaries being the military domain.

I begin the proposed approach by analyzing the legislative and institutional framework that initiates, develops and implements projects for the development of littoral facilities. The Romanian littoral has a length of 244 km, between the Musura and Vama Veche Canal, with a curved shape without facilitating the formation of bays, the form facilitating the erosion of beaches and other forms of coastal relief. I consider it necessary to take all constructive measures to strengthen the Romanian littoral against erosion in order to protect the environment and create economic facilities. Most of the Romanian littoral is under the responsibility of national public institutions.

Achieving public investment at high quality standards, eliminating the risk of building poor quality constructions and failing to comply with the fundamental requirements laid down by legislation on quality in construction determine the desirability of a legislative framework that removes investment bottlenecks that lead to an excessive formalization of the implementation process. The existence of a well-grounded legislative framework will facilitate the development of projects that, through the effects they produce, add value to the development of national infrastructure to support the Community needs for European integration.

One should bear in mind that the European Union currently manages the following major programs, i.e., the European Regional Development Fund (*Fondul European de Dezvoltare Regională, FEDR*) – regional and urban development; the European Social Fund (*Fondul social european, FSE*) – Employment, Social Affairs & Inclusion; the Cohesion Fund – economic convergence of less developed regions; the European Agricultural Fund for Rural Development (*Fondul european agricol pentru dezvoltare rurală, FEADR*); the European Maritime and Fisheries Fund (*Fondul european pentru pescuit și afaceri maritime- FEPAM*).² Also, other funds are managed by the EU, provided through grants, for projects with EU policy activities and contracts concluded by EU institutions for the purchase of services, goods or works. In the area of research and innovation, the EU partly finances several research projects.

The European Regional Development Fund (Fondul European de Dezvoltare Regională FEDR) – regional and urban development aims to "strengthen economic and social cohesion within the EU by correcting existing imbalances between their regions".³ One of the priority areas is support for small and medium-sized enterprises. In this area, the EU focuses primarily on geographically disadvantaged areas, peripheral areas, which require special treatment. In my opinion, the littoral is one objective of interest that can be the subject of regional development programs.

² <https://ec.europa.eu>, Fondul European de Dezvoltare Regională, accessed 28.11.2018.

³ *Idem*.

The European Social Fund (Fondul social european, FSE) – Social Inclusion and Good Governance, aims at combating poverty and providing employment opportunities and supporting the mobility of employees.⁴

The Cohesion Fund – the economic convergence of the less developed regions, aims to promote sustainable development by eliminating economic and social disparities by supporting projects that contribute to the development of infrastructure, mainly the trans-European transport network, but also environmental issues, environmental protection that makes visible the improvement of the environment.⁵

The European Agricultural Fund for Rural Development (Fondul european agricol pentru dezvoltare rurală, FEADR) has as its objectives the competitiveness of all branches of agriculture. Thus, I believe that in this area, the protection of high slopes and terases, in areas close to agricultural works, can be strengthened by accessing such funds.

The European Maritime and Fisheries Fund (Fondul european pentru pescuit și afaceri maritime – FEPMAM), contributes to the management of fisheries but also to the development of policies for the conservation of the fishery fund. The aquaculture sector must be in the EU's attention not only from the point of view of economic opportunities, therefore, they realize that the specific arrangement of the littoral would facilitate the construction of littoral farms, which would also contribute to the development of economically exploitable natural barriers.

Through these programs, the EU aims to spend public money transparently and responsibly, and beneficiaries can access funds and develop programs that provide multiple functions and benefits. These must be in the attention of those institutions that develop programs that contribute to the territory development.

At national level, the activity of territorial preparation is regulated by Law no 350/2001, on urban planning and territorial planning, with subsequent amendments and completions, the National Strategy for Sustainable Development Romania Horizons 2013-2020-2030⁶, the Strategic Concept for Territorial Development Romania 2030⁷, the Partnership Agreement for 2014-2020⁸, etc.

The National Strategy for Sustainable Development Romania Horizons 2013-2020-2030 provides Romania's alignment with the sustainable development paradigm, a philosophy of the European Union, in which society and environmental protection occupy an important place. The Strategic Territorial Development Concept Romania 2030 includes among the strategic objectives the protection, development and valorisation of natural and cultural heritage.

The Partnership Agreement provides for measures to ensure an integrated approach to territorial development during the 2014-2020 programming period. It sets out the main territorial priorities in line with the "Territorial Development Strategy of Romania"⁹, which highlights the improvement of the quality of life for local and regional communities, for

⁴ *Ibidem*, Fondul social european, accessed 28.11.2018.

⁵ *Ibidem*, Fondul de coeziune, accessed 28.11.2018.

⁶ National Strategy for Sustainable Development of Romania Horizons 2013-2020-2030, Government of Romania Ministry of Environment and Sustainable Development, United Nations Development Program National Center for Sustainable Development, Bucharest-2008.

⁷ Romania Government, Ministry of Development of Public Works and Housing, Strategic Concept of Territorial Development Romania 2030, A Competitive, Harmony and Prosperous Romanian, Edited by the Ministry of Development of Public Works and Housing, Bucharest, October 2008.

⁸ The partnership agreement includes five European structural and investment funds (ESI funds): the European Regional Development Fund (ERDF); The Cohesion Fund (CF); The European Social Fund (ESF); The European Agricultural Fund for Rural Development (EAFRD); European Maritime and Fisheries Fund (EMFF); Euro-Permanent Commission, Brussels, August 2014.

⁹ Ministry of Regional Development and Public Administration, <http://www.mdrap.ro/dezvoltare-teritoriala/-2979> accessed 10.01.2019.

Romania's regions to become more attractive for living, leisure, investment and work; increasing accessibility and connectivity; fair access to services of general interest. In this respect, three national funding priorities presented contribute to sustainable development: promoting economic competitiveness and local development, developing modern infrastructure for growth and jobs, optimizing the use and protection of natural resources.

It is encouraging that the agreement mentions the need for specific policies and measures for some areas with particularities such as the Danube Delta, coastal area, cross-border areas, peripheral rural areas, areas that correspond my concerns about the need to set up multi-purposes littoral facilities.

In line with Romania's territorial development strategy, integrated territorial investments are an instrument to stimulate the creation of functional urban areas and the implementation of this strategic objective. The use of integrated regional investment as a development tool will increase the efficiency of strategic project management mechanisms, and will recognize the responsibility of local authorities as direct beneficiaries. Integrated territorial investment must be geared to regional needs, to pursue integrated regional development and cooperation between regions. Integrated territorial investments are based on the synergistic principle of using European Structural Funds, national funds and other sources of funding from the national or local budget to avoid duplication, uneven dispersion or preferential allocation.

The integrated regional development is based on principles that take into account the typology of urban settlements, pursuing potential growth poles, creating metropolitan areas, developing tourist resorts. Cooperation between regions pursues, among other objectives, the development of tourism and the promotion of cultural and natural heritage in border areas, the development of cross-border infrastructure – in the field of transport and the environment. The infrastructure development refers among others to the development of infrastructure for disaster management and natural threats.

To achieve such objectives, I believe it is necessary to pursue the main territorial development instruments and funding axes, which are ways to support projects that contribute to the achievement of territorial development priorities.

I will continue to identify some national projects that can contribute to territorial planning and the creation of littoral facilities. Strategic projects on the development of the national territory are included in the "Territorial Development Strategy of Romania", which sets out the development objectives, measures, actions and concrete projects at territorial level with a development vision for the time horizon 2035.¹⁰

Taking note of the content of the planning exercise for the national territorial planning, we note that among the concerns are also the areas on the territory that require specific interventions for capitalizing or protecting the natural and built capital. If these projects identify development projects in these areas, they can in turn generate economic growth, maintain and attract labor, all of which are considered measures that should help to preserve the identity of the national territory.

The 2014-2020 Regional Operational Program (ROP) is the successor of the 2007-2013 Regional Operational Program and one of the programs through which Romania can access the European Structural and Investment Funds from the European Regional Development Fund (ERDF) for the period 2014-2020. I think it is appropriate to create a new operational program that meets national needs for the later period.

¹⁰ Romania Territorial Development Strategy, Polycentric Romania 2035, Cohesion and Territorial Competitiveness, Development and Equal Opportunities for People, elaborated by the Ministry of Regional Development and Public Administration.

In Romania, the territorial planning and urbanization activities are carried out in accordance with the provisions of Law 350/2001, as amended. This legal framework requires permanent adaptations to the field of territorial planning, urban planning and construction, which is constantly changing. The Ministry of Regional Development and Public Administration (MDRAP) initiated the project "Systematization of legislation in the area of spatial planning, urbanization and construction and strengthening of the administrative capacity of the specialized structures in the central public institutions with responsibilities in the field".

It is worth mentioning that a permanent inter-institutional consultation is required according to the provisions of Law no. 52/2003 and the provisions of the Government Decision no. 521/2005. From the defense sector, mainly military, initiatives can be launched to benefit from the economic or social field.

The attributions of the central public administration in the field of territorial planning are coordinated by the Romanian Government. It sets out on the priorities of the governance program, development programs, lines and sectoral policies. In the field of territorial planning, the Ministry of Regional Development and Public Administration is the specialized authority of the Government, having the attributions stipulated in art. 14 of Law 350/2001, including the elaboration and coordination of strategies and plans, documentation and regulations, consultations and initiatives on regional territorial planning.

The attributions of the county public administration in the field of territorial planning, through the county council, are oriented towards the territorial planning, the organization and the urban development of the localities. The county council can initiate projects and approve the county and zonal spatial planning plans through the chief architect. Provides specialized assistance to local councils in order to consistently and uniformly transpose the provisions of approved land use planning documents at local level.

The attributions of the local public administration in the field of territorial planning, through the local council, are directed towards ensuring compliance with the provisions of the territorial planning documentation. For this purpose, the local council uses information from all areas of economic and social activity in accordance with the statutory duties.

At national level, legislative framework solutions are developed to regulate the national territorial planning through *Zonal Territorial Planning Plans (Planuri de Amenajare a Teritoriului Zonal)*.¹¹ Depending on the territory for which they are being developed, these plans may be: regional, inter-county, inter-departmental, inter-communal, peri-urban, metropolitan and border. From this point of view, the Romanian littoral is covered by plans for maritime border planning. It is true that this area is administrated in partial or in part by some administrative tertiary units, county, municipal or communal councils.

As a national interest, the Zonal Territory Planning Plan (Planul de Amenajare a Teritoriului Zonal, PATZ) – Black Sea Coast 2010 was developed. This plan defines the framework for the conduct of economic and social activities in accordance with the national territorial planning. In my opinion, there are no measures in this plan that would also meet military requirements regarding land use, based on the same profiles regarding the possibilities of development of the area, natural patrimony, the usefulness of existing land, etc.

The Managing Authority for Operational Programs is the Ministry of Regional Development and Public Administration which coordinates and monitors institutional actions within the mechanisms and procedures for implementing the strategic programs for the various regional and European cooperation programs.

Operational Programs: Large Infrastructure Operational Program (Programul Operațional Infrastructură mare, POIM); Operational Program for Competitiveness

¹¹ Law no. 350/2001, on Territorial Planning and Urban Planning (2007 updated version, with laws and governmental decisions).

(Programul Operațional pentru Competitivitate, POC); Operational Program for Technical Assistance (Programul Operațional pentru Asistență Tehnică, POAT); Regional Operational Program 2014-2020 (Programul Operațional Regional 2014-2020, POR); Operational Program for Administrative Capacity (Programul Operațional pentru Capacitate Administrativă, POCA); Operational Program for Human Capital (Programul Operațional pentru Capital Uman, POCU); National Rural Development Program (Programul Național de Dezvoltare Rurală, PNDR); Operational Program for Fisheries and Maritime Affairs (Programul operațional pentru Pescuit și afaceri maritime, POPAM). For the development of initiatives, they need to be linked to the directions of these development programs.

Most of the Romanian littoral is in the management of the National Administration "Apele Române".¹² The institution is coordinated by the central public authority and is a sole operator on water resource management, regardless of the holder of any title of the arrangement, which allocates the right to use water resources with their natural potential, respecting the legal conditions.

According to the national legislation, the Romanian National Water Authority „Apele Române”¹³ (ANAR) is an autonomous national public interest coordinated by the Ministry of Environment, Waters and Forests, which manages the infrastructure of the national water management system and for the sustainable management of water resources, which is a natural monopoly of strategic interest. Among the tasks of the agency that interfere with the littoral are: the management, exploitation and maintenance of the natural seafront promenade or the beaches in the patrimony.

In order to carry out construction works in the area under the patrimony of the administration, it has the obligation to issue an opinion, called *Aviz AN Apele Române*, which is one of the important documentation requested by the competent authorities within the mayoralties through the Urbanism Certificate for Building or Building on Waters or in connection with surface or underground waters. The National Authority has as its main tasks the knowledge, protection, valorisation and sustainable use of water resources.

It has a natural monopoly of strategic interest in the management of the national hydrological, hydrogeological and water quality network of the public domain, as well as the management of the national water management infrastructure.¹⁴ So, from this point of view, the Romanian littoral is subject to special regulations regarding its administration and exploitation.

The general preoccupations of Romanian specialists are directed mainly to the protection of the environment, which includes the protection of habitats and biodiversity, which is achieved through littoral consolidation projects. The beneficiaries included are the economic sector through the tourism sector that benefited most from the investments.

The regional development project "Protection and rehabilitation of the southern part of the Romanian Black Sea seaside in Constanta and Eforie Nord area" („*Protecția și reabilitarea părții sudice a litoralului românesc al Mării Negre în zona Municipiului Constanța și Eforie Nord*”) implemented by the Romanian National Administration “Apele Române”, had as objectives the artificial beaches, the rehabilitation of the existing dams, the construction of the epi, longitudinal dams and submerged dams, etc.

¹² By Government Decision no. 981 of 29 December 1998 the National Company "Apele Române" SA Bucharest is established. Currently it operates under Law no. 404 of October 7, 2003 for the approval of Government Emergency Ordinance no. 107/2002 on the establishment of the National Administration "Apele Române", with subsequent modifications and completions, the author's note.

¹³ established in 2002 through the reorganization of the "Apele Române" Company and by taking over the hydrology, hydrogeology and water management activities of the National Company "Meteorology, Hydrology and Water Management", in order to manage, preserve the integrity and protection of public patrimony of national interest, the author's note.

¹⁴ <http://www.rowater.ro/Descrierea%20activitatii/Forms/AllItems.aspx>, accessed 15.12.2018.

The project is to be further developed in a new implementation phase: "Reduction of coastal erosion Phase II" („*Reducerea eroziunii costiere Faza II*”), through the Operational Program for Large Infrastructure (*Programul Operațional Infrastructură Mare POIM*). At this stage the artificial sanding of beaches and other hydrotechnical works will continue in Edighiol and Periboina, Mamaia Nord, Tomis (Casino), Agigea, Eforie Nord and South, Costinești, Olimp, Neptun, Jupiter, Balta Mangalia -Venus-Aurora, Mangalia-Saturn.¹⁵

For this phase, the "Apele Române" National Administration, through the Dobrogea-Litoral Water Basin Administration (Administrația Bazinală de Ape Dobrogea-Litoral), will carry out the following works: removal of the existing littoral structures; the construction of new littoral structures connected to the shore; replacement of dams and associated equipment for handling its; rehabilitation of concrete structures; protection pillars of electricity; shore protection, coastal stabilization, sand beaches, etc.

It is noteworthy that the purpose of the project is mainly environmental protection and less the development of economic or military facilities. Although the military purpose is complementary to a civil purpose, costs would not have been substantially affected by multiple objectives. From a military point of view, some of these works can be used for a tactical purpose.

In my opinion, alongside the capitalization of these works, complementary to these measures, programs can be designed to build economic facilities that offer advantages to the military. I believe that the littoral settlement solutions aim to protect the floods in the Romanian littoral area, the Danube Delta and the Razelm-Sinoe lagoon complex, by identifying constructive solutions that reduce costs and multiply the number of beneficiaries.

The measures adopted through programs initiated at national level produce visible effects on territorial integrity by the fact that the active presence of state institutions in the littoral area creates the prerequisites for regional stability. It may seem surprising that the above-mentioned measures identified in this strategic project can help preserve the identity of the national territory.

However, it is worth mentioning that alongside the preservation of traditions, the promotion of national values, the preservation of ethical qualities, the promotion of culture, the language, elements of national identity as a historical heritage, in the conditions of an irreversible globalization, the identity of the national territory must not be minimized or left to chance. In order to argue the importance of the nation's active position on the national borders, I will briefly outline the evolution of the border with Ukraine, which, due to historical events and situations in which we have been in a reactionless state, still presents the core of discussion on the membership of certain areas considered sensitive.

I briefly recall the border negotiations with our neighbors in the north, regarding the delimitation of the Danube Delta border, the Musura Canal and Bara Sulina. In 1940, after the occupation of Bassarabia and Northern Bukovina, on June 28, 1940, Grigore Gafencu, as Romanian ambassador to Moscow, was invited by Vladimir Dekanozov, deputy commissioner of the Soviet Union Commissariat of Foreign Affairs (USSR), for border demarcation under the new conditions. The frontier line was on the last day of June 26, 1940, on the Chilia arm. During the negotiations, the Russian side challenged the border established at 1877 and 1918 at the mouth of the Danube on the Chilia arm.

The strategic importance for the USSR of the Chilia arm for river navigation was underlined, as they considered that Romania was sufficient for the other two arms. The Russian delegation was based on a provision of the Ribbentrop-Molotov Pact, foreign to the Romanian delegation at the time. The request was contrary to international law, and the

¹⁵ HG 667/2016 the approved costs are 1,018,225 thousand RON for Stage I and 2,414.117 thousand RON for Stage II.

Romanian delegation led by General Constantin Sanatescu challenged this. Soviet Army force interventions took place near the Chilia branch, a total of six islands, totaling 23.75 km², the frontier line being moved to the Musura Canal and the southern bay of the same name.

The action in force have been presented the Romanian delegation with a fait accompli. The Romanian delegation's protest was not accepted. Even though the occupied area was small, its strategic importance was immense, as the frontier line follows the southern talveg of the Chilia Arm, the frontier line descending south, close to Sulina's arm at the seaside. The aspect has direct influences on the lines of the continental shelf. This was actually the stakes of this move.

After the end of the armistice with the USSR, on September 12, 1944, the area remained considered by the Russian side to have remained theirs. Dr. Petru Groza, as Prime Minister of the Romanian People's Republic, was obliged to sign another armistice on February 4, 1948, which bounded the border between the two states, set against a treaty signed in Paris in 1947¹⁶. The border was fixed through the channel and bay of Musura to Sulina, Romania, losing this time seven islands on the Chilia branch and a part of the continental plateau that included the Serpilor Island.

This protocol has never been ratified by the Romanian side, supported only by a protocol signed by the representatives of the foreign ministries of the two countries. But in 1961, on February 27, a Protocol was signed between the Romanian and Soviet Governments ratifying the provisions of the 1948 acts. However, I consider the fact well known at international level that such a move should have been ratified by the Parliaments of the two countries, being national territories, and this has not happen.

In the discussions with the old fishermen of the place, I learned that sometimes they used to rest on the sheltered coastline of the Serpent Island or on the islands of Chilia's branch from the sea, considering that it was a Romanian territory, as they learned from their elders. After the Second World War, they were hunted by the Russian border guards, without any reaction from the Romanian side. I conclude that the passive, unresponsive attitude has not helped us in this situation, so we need to permanently show the active presence in any area of the national territory that seems seemingly lacking in the stake. History has shown the opposite.

Regardless of the deed, de jure, at that time it was valid for the 1947 Peace Treaty in Paris. Only in 1997, on June 2, the talks resumed in Constanta, between Romania and the Ukrainian side, was signed a neighboring treaty about the border line on the Musura arm, which opened a new dispute, due to the fact that the alluvial deposits altered the length of the channel, leading south to the Romanian-Ukrainian border, near the Sulina lighthouse through the bay formed between Bara Sulina and the Musura canal. The dispute was subsequently resolved at The Hague decision no. 2009/9, which de jure establishes the frontier line and delineations of the continental shelf.

Today, de facto, the border line is kept on the northern bank of the channel at the Bara Sulina, although, de jure, it was established further north, so the Musura bay belongs to Romania. Due to the lack of reaction of the national authorities, the neighboring border guards dispatched some buoys in points other than those established. Thanks to the special regime of the border, the interest in exploitation of the area has decreased, so that the Romanian fishermen are restricted to exploiting the potential of the area, and therefore are targeting other permissive areas. On the other hand, Ukrainian fishermen have no limitations on fishing and therefore they have easy access to the area.

A major disadvantage that translates into the de facto loss of an important territory, only by the lack of reaction of the decision-makers to these facts, legislative conditions, the lack of economic facilities, but also due to the common sense of the inhabitants who do not

¹⁶ The Treaty of Paris, 1947, provided that the Romanian-Soviet border was fixed on the thalvel of the Chilia arm, author's note.

want to enter in conflict with the state institutions, but sanctioning these unconscionable measures, in their conscience.

Having met the first two objectives of my approach, I will continue to try to identify how to optimize the process of developing land-use planning in the seaside area, targeting different areas of interest through common investment and low costs.

In 2009, the National R&D Institute for Urbanism and Territorial Planning initiated the "Development Methodology and the Framework Content of the Territorial Planning Documentation for the Black Sea Coast" ("Metodologia de elaborare și conținutul cadru al documentațiilor de amenajarea teritoriului pentru zona costieră a Mării Negre"). This project was carried out in several phases of legislative and consultation drafting, with a final document being developed that responds to the specifications, through an analysis of the existing situation, diagnostics and the identification of priorities, which have consolidated a common strategy.

The final document contains the legislative landmarks and the documents necessary for the spatial planning of the Romanian coastal zone, according to the provisions of Law no. 350/2001 on spatial planning and urbanism. The proposed landscaping plans follow the main directions for the development of the national territory or counties level. The Territorial Planning for the Romanian Coastal Zone (Planul de amenajare a teritoriului pentru zona costieră a României, PATZIJ – ZC)) represents a plan for the territorial planning of the area, the seaside being divided by the counties of Tulcea and Constanta, each with specific peculiarities.

I believe that by this approach, it is accepted that the arrangement of the national territory has an important role in the management of the coastal zone and there is legislation to support such an approach. If the content of this legislative framework, the national territorial planning segment would find correspondence, then the optimization of the legislation is achieved.

The legislative framework governing the construction aspects of the coastal area is Law 280/2003. It takes into account the conservation of environmental conditions and patrimonial and landscape value in the areas adjacent to the shore. Among the constructive provisions, it is mentioned that economic-social facilities which meet certain specifications regarding the national territorial planning may be subject to exceptions.¹⁷

In my opinion, the approach to building offshore facilities should be initiated by the local community. This must be supported by the deliberative and executive authorities at the local, county or central level. Under the terms of a strategic project of national or regional importance, the Government, through the authority of the central public administration for spatial planning and urban planning, must be the highest supporter. However, the initiative may even go from natural or legal persons who want to achieve some economic and social facilities and, by their usefulness, respond to specifications for defining the territory for defense.¹⁸

In accordance with national law, the central public authority for public works, transport and housing will ensure the development of land use and urban planning plans, including coastal management prescriptions.¹⁹ Because the Romanian seaside is an area of general interest, national and regional, the planning documentation must be financed from the state budget, through the ministry, the Ministry of Regional Development and the public administration. Because most of the seaside is in UNESCO World Heritage, any initiative

¹⁷ Law no. 280/2003, art. 16, al.1, 2.

¹⁸ Methodology on the elaboration and content of coastal planning documentation for coastal areas; plan for the spatial planning of the Black Sea coastal zone, Phase II, Contract no. 394/2009, elaborated by the National Institute for Research and Development for Urbanism and Spatial Planning, 2009, chap. II, art. 3

¹⁹ Art. 67. (3) of the Law no. 280/2003 for the approval of Government Emergency Ordinance no. 202/2002 on Integrated Coastal Zone Management.

becomes public and of general interest and can therefore be funded from the state or community budget through the aforementioned funds and underlined mechanisms.

My proposals aim at adopting measures to comply with these legislation on land use, streamline, optimize and support them. To this end, I believe that it is necessary to develop coherent plans for the development of some national projects at the seaside, from which the military domain can benefit.

The Public Procurement Act (Legea achizițiilor publice)²⁰ and the Public-Private Partnership Law (Legea parteneriatului public-privat)²¹ are legislative benchmarks on how to implement some coastal development projects. Permanent changes are made to legislative provisions that align with changes and variables arising from the dynamic environment in which they apply, such as Emergency Ordinance no. 6/2017 for the modification and completion of some normative acts, as well as for the establishment of measures regarding the realization of investments financed by public funds.

From a social point of view, I consider the first beneficiaries to be local communities. Therefore, in an analysis of the legislation in force we found that the normative act regulating the realization of the public investments in the local infrastructure is Government Emergency Ordinance no. 28/2013.²² Through this program beneficiaries have the opportunity to promote those investment objectives that provide essential services for increasing the quality of life. Emphasis is placed on the main areas of education and health, but I have identified that modifications²³ have been made with the introduction of programs for the construction, modernization and rehabilitation of bridges, footbridges, passages or pedestrian bridges.

In the field of publicly funded investments, the Government of Romania has issued a series of ordinances regulating the legal framework in the field of investment realization, especially of infrastructure investments. These ordinances aim at facilitating the increase of absorption, efficiency and impact of the implementation of national, regional and local projects, made from structural European funds and from public funds.²⁴

The adoption of measures to update the legal framework for the realization of infrastructure investments made by European structural funds and public funds has led to the establishment of cost standards for publicly funded investments and publicly funded investments.²⁵ Recently the legislative framework governing the achievement of objectives, projects and investments financed entirely or partly from public funds has been adopted, with compliance with the cost standards based on current technical and functional concepts.

I believe that the development of coastal planning programs benefits from the existence of a legislative framework in line with the provisions of the internal and Community legislation that need to be strengthened with provisions that facilitate land-use and defense by

²⁰ Law no. 98/2016 on public procurement has undergone changes through O.U.G. no. 45/2018 published in the Official Gazette no. 390 of 23 May 2016 and other later amendments.

²¹ Law no. 233/2016 on public-private partnership entered into force from 25 December 2016 until 17 May 2018. It was repealed and replaced by the Emergency Ordinance no. 39/2018 of 10 May 2018 regarding the public-private partnership, issued by the Romania Government, published in the Official Gazette no. 427 of May 18, 2018.

²² The Ordinance approving the National Program for Local Development, as amended and supplemented, published in the Romania Official Gazette, Part I, no. 230 of 22 April 2013.

²³ Law no. 89/2015, as amended and supplemented.

²⁴ Government Emergency Ordinance no. 6/2017; Government Decision no. 363/2010, Government Decision no. 1394/2010; Emergency Ordinance no. 85 of 13 September 2018 for the repeal of some legal provisions in the field of publicly funded investments, published in the Official Gazette no. 805 of 20 September 2018.

²⁵ Government Decision no. 363/2010 on the approval of cost standards for publicly funded investment objectives, as subsequently amended and supplemented; Government Decision no. 1.394 / 2010 approving the cost standards for investment objectives financed from public funds in the field of transport infrastructure, as subsequently amended and supplemented.

providing direct state support. For this, there is still a need to improve the administrative capacity to enforce compliance with national legislation in line with the European law.

In order for my approach to be fully timely, I believe that the military field can directly contribute to the set up of an optimal legal framework regulating the ways of achieving integrated development programs at national level, of which the seaside region can benefit, for the benefit of multiple beneficiaries, including the National Defense System.

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PUBLIC DEBT OF ROMANIA – LEVEL AND EVOLUTIONS

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Abstract:

As long as the economic growth is higher than the budget deficit, which determines the debt level, the debt-to-GDP ratio will decrease. But nothing guarantees that this will happen for the future. Because almost all forecasts of economic growth have already fallen below 4%, compared with the 5.5% anticipated by National Commission of Forecast. Given that public debt repayment is an unconditional and irrevocable obligation for the authorities to pay capital, interest and other borrowing costs borrowed or guaranteed, in this article I propose to make a radiography of the budgetary system highlighting some mechanisms that delimit public debt and its effects on the national economy. In essence, the public debt formation mechanism is based on the budget deficit generated by the costs of the economic and social actions of the government and public institutions in constant change as well as the external balance of payments deficit.

Keywords: *public debt; budget; deficit; GDP; the government public debt; internal and external public debt.*

I. Public debt and its forms

Public debt represents the totality of financial obligations - internal and external – of the state, at a given moment, originating from loans contracted directly or guaranteed by the Government, through the Ministry of Public Finance, or by local public administration authorities from diverse creditors, individuals or resident or non-resident legal entities in Romania.

Obligations represent commitments resulting from contracting loans, namely: repayment of the loan, interest payments, of commissions, of some special advantages granted to creditors. The obligations of state resulted from loans contracted and guaranteed by the state for a period of one year are limited by the public indebtedness superior margin established annually through law.

The public indebtedness superior margin represents the total amount of financial obligations which I can contract and guarantee central and local public administration authorities, over a one-year period, which is established annually by law.¹ It includes internal public indebtedness superior margin and external public indebtedness superior margin.

The internal public indebtedness superior margin represents the maximum amount of loans contracted and guaranteed by the central and local public administration authorities from the internal market, over a period of one year.

The external public indebtedness superior margin expresses the maximum amount of external loans contracted and guaranteed by the central and local public administration authorities for a period of one year.

The value total of public debt is entered in the "Public Debt Registry".

¹ Tatiana Moșteanu, *Public Finances*, University Publishing House, Bucharest, 2005, p. 85.

The public debt register, in which the situation of the public debt is highlighted in chronological order, has four components:

- The sub-register of internal governmental public debt;
- The sub-register of external governmental public debt;
- The sub-register of internal local public debt;
- The sub-register of external local public debt.

Each of the four sub-registers have two distinct positions, respectively for direct public debt and guaranteed public debt.

At the end of the year public committed debt is highlighted in the document called "the general government debt account".

This document is accompanied by a report comprising an analysis of the main problems related to the level of public debt, the public debt service, as well as the guarantees of the state for credits contracted by economic agents.

The effect of public debt on the short-term economy takes the form of non-incentive investment, as a result of a budget deficit-generating budget policy.

As the state increases public spending, it undermines the national economy, having negative effects on investment. In the long run, public debt negatively influences both capital and national output.

Regarding the contracting of the public debt, the Government is authorized to contract internal and external state loans only through the Ministry of Public Finance, for the following purposes, which are a priority for the Romanian economy²:

- a) the financing of the state budget deficit, the temporary financing of the deficits from the previous years of the state social insurance budget, until the allocation with sums with this aim, financing the temporary deficits of the state budget, the state social insurance budget and the State Treasury budget from the current exercise and refinancing government public debt, under conditions accepted by the Ministry of Public Finance;
- b) permanently maintaining the corresponding balance in the general current State Treasury account, established by the Ministry of Public Finance;
- c) financing some projects or other needs approved by Government Decision;
- d) sustaining balance of payments and foreign exchange reserves;
- e) other situations stipulated by law.

In the process of the contracting and administering the public debt, the Ministry of Public Finance follows, taking into account market conditions, the following objectives:

- optimizing liquidities for performing budget expenditures;
- limiting the refinancing risk;
- optimizing the weight in the portfolio of the negotiable government securities;
- currency exchange risk management and the interest rate risk;
- diversification of the creditors' base
- constituting the interest rates on government securities in reference interest for the financial mitigating activity in Romania;
- optimizing budget expenditures with the public debt according to the other objectives.

The public debt instruments include, but are not limited to the following:

- a) the government securities issued on the domestic or external market, at the times and in the amounts deemed appropriate, in order to fulfill the objectives of the debt management process;
- b) the State loans from banks, from other credit institutions, Romanian or foreign legal entities, under conditions resulting from negotiations;

² Emergency Ordinance no. 64/2007 on public debt, published in the Official Gazette no. 439 of June 28, 2007

- c) the government loans from governments and foreign governmental agencies, international financial institutions or other international organizations;
- d) the temporary loans from the current account of the State Treasury, according to the law;
- e) the state guarantees³.

The repayment of public debt is an unconditional and irrevocable obligation of the central or local authorities to pay capital, interest and other costs related to borrowed or guaranteed loans: commissions, discount amounts, other services related to borrowing, and expenditure on the services provided by rating agencies for the country risk assessment to be paid from the state budget (in the case of State loans).

According to the legal provisions, the sources of payment for the public debt service are as follows:

- a) the availability of the Treasury general current account of the State;
- b) the loans to finance and refinance public debt;
- c) the expenditure provided for with this destination in the state budget;
- d) the amounts cashed in by the financial institutions mandated by the Ministry of Public Finance for to administer the external borrowings contracted by it;
- e) the amounts collected by the Ministry of Public Finance from the final beneficiaries of the loans based on subsidiary loan agreements
- f) the amounts provided in the budgets of the final beneficiaries, in accordance with the loan agreements concluded between the Ministry of Public Finance, the local public administration authorities and the economic agents under their authority, under the terms of the loan agreements between the state and creditors;
- g) the amounts provided in the budgets of economic agents that have contracted state-guaranteed loans;
- h) the risk fund for the situations where the guarantees issued by the Ministry of Public Finance are executed or if the final beneficiaries of the loans do not have their own financial resources to pay the payment obligations;
- i) other sources, under the law.

For covering the financial risks which result from of the State to guaranty the loans contracted of the legal persons from the creditor institutions, as well as from the loans contracted directly by the state and afterwards borrowed by the final beneficiaries, the risk fund is constituted.

The risk fund represents the fund set up at the Ministry of Public Finance from:

- amounts received in the form of commissions from the beneficiaries of the state-guaranteed or the sub-loaned loans;
- interest and penalties for late payment applied for non-payment by the final beneficiaries of the loans, of the commissions to the risk fund and, respectively, the due installments, interest, commissions and other related costs of the loan as well as from other legally constituted sources.

In essence, the public debt mechanism is based on the budget deficit generated by the costs of the economic and social actions of the government and public institutions in constant change as well as the external balance of payments deficit.

II. Characterization and classification of public debt

Public debt includes the total amount of the sums borrowed by the state central administration, local government and other public institutions, from individuals or businesses, of the internal or external market, to be reimbursed in a certain period. Unlike public debt, the

³ State guarantee is an obligation of the Romanian State, which is executed, if the beneficiary of the loan has no ability to pay, in whole or in part, the loan, interest, commissions and other costs determined in accordance with the terms of the guaranteed loan.

indicator 'public debt service' expresses the total amounts (rates and interests) to be repaid over a given period.

Public debt is established and distinctly managed depending on its two types:

- the government public debt;
- the local public debt.

Government public debt expresses a "portion of the public debt, which represents the amount of internal and external financial obligations of the state, at a given moment, coming from the loans contracted directly or guaranteed by the Government, through the Ministry of Public Finance, on behalf of Romania, from the financial markets.

Local government debt represents a part from the public debt, the one which designates the whole internal and external financial obligations of local public authorities, at a given moment, coming from loans directly contracted or guaranteed off the financial markets.

Borrowings contracted by local government authorities, which are instruments of local public debt, are part of Romania's public debt, but do not represent debts or responsibilities of the Government.

Also, public debt depending on the reimbursement term is classified as follows:

- short-term (floating) public debt;
- public debt in the medium and long term (consolidated).

Depending on the quality of creditors, public debt may be:

➤ gross public debt, given by the total value of the loans, no matter where they are placed;

- net public debt, which does not include the value of loans placed at state institutions.

Depending on the creditors' premises, we meet:

- internal public debt (debtor and creditor are from the same country);
- external public debt (the creditor is from another country).

The government public debt represents the whole amount of the State's financial obligations, at a given time, coming from reimbursable funding committed on a contractual basis or guaranteed by the central public administration authorities.

Government debt is generated by⁴:

- government securities in national currency, including government securities in currency, reimbursable from budgetary resources; if resources are not sufficient to ensure the payment of the internal public debt service, new documents are issued, thus generating the consolidation of the public debt;
- the state loans from the National Bank of Romania meant to cover the cash gaps between budget cash-ins and payments;
- the state loans from commercial banks, foreign banks or from foreign companies;
- the loans from governments and foreign government agencies, international financial institutions or other international organizations;
- the state loans from other financial institutions, legal entities, in conditions the result from negotiations;
- temporary borrowings from of the available funds of the state treasury general current account;
- state guarantees to loans contracted by various borrowers.

Public debt payments are made on the basis of a permanent budget authorization for the execution of these expenditures.

III. Public debt management

Public debt management consists of establishing a state debt management strategy capable of mobilizing the amounts needed to finance, achieve the risk and cost targets set by the authorities and the other objectives set by them, such as developing and maintaining an appropriate market of state securities.

⁴ Emergency Ordinance no. 64/2007 on public debt, published in the Official Gazette no. 439 of June 28, 2007.

In the wider context of national economic policies, states must make sure that both the level, and the growth rate of public debt is sustainable, and public debt service can be assured in various situations while respecting cost and risk objectives. It is also necessary to keep public sector indebtedness on a viable trajectory, and to implement a credible debt reduction strategy if it is excessive.

The main objective of public debt management should be to ensure the state's financing needs at the lowest possible long-term cost and to maintain risk at a prudent level. In order to achieve these goals, public debt managers have a number of options for defining the terms and conditions for issuance of government securities, which are considered to be of particular importance in the choice of investors when choosing to place their savings in government bonds. As the private sector develops, the external debt of the public sector must be less important and even reduced.

Public debt management implies, on the one hand, maintaining public sector indebtedness at an acceptable level, but also developing a strategy to reduce public debt, if it tends to exceed a certain superior margin considered sustainable.

The essential objective of public debt management represents, on the one hand, the mobilization of financial resources necessary to the state, as well as the fulfillment of its short-, medium – or long-term payment obligations, keeping the risk level as low as possible. When the state decides to use loans to finance different objectives, it must avoid too close maturities, which would give rise to a particular pressure on the reimbursement capacity but also those too far in time, that would generate significant interest and commissions. On the other hand, resorting to loans made on to the internal market is preferable and currency resources to finance the current account deficit should be obtained in a larger proportion out of the export of goods and services.

Thus acquired, these resources should be used as a priority to finance different economic projects, and less to cover budget deficits or current account deficits. In the event of a serious financial deficit (of the governmental sector - the budget deficit, but also of the non-governmental sector - the real economy), the state can choose, instead of exhausting the country's reserve of currency and gold, budgetary adjustment. The orderly adjustment implies an active collaboration with the International Financial Institutions, not only in terms of lending, but also in the development of structural economic adjustment measures. Public debt management in Romania aims both at reducing the cost of public debt service and at reducing the risks associated with the government public debt portfolio. The risks associated with the government public debt portfolio are the following: market risk, refinancing risk, liquidity risk, credit risk and operational risk.

Repayment of public government debt is an unconditional and irrevocable obligation of payment of capital, of interest rates, of commissions, and other costs incumbent to the reimbursable finances employed or guaranteed. Expenditure on the services provided by rating agencies for country risk assessment, commissions, interests, discount value and other costs related to contracting repayable financings on behalf and account of the state will be paid out off from the state budget.

Romania's debt repayment strategy must strike a balance between floating debt and consolidated debt in order to avoid too close maturities that would put pressure on the state's ability to repay but also to avoid accumulating interest on debt, as a result of medium and long-term borrowing. The strategy of reimbursing Romania public debt must strike a balance between floating debt and consolidated debt in order to avoid too close maturities that would put pressure on the state's ability to repay but also to avoid accumulating interest on debt, as a result of contracting of some medium to long-term loans.

IV. Economic premises on the evolution of Romania's public debt

The public debt cannot grow indefinitely, it must meet certain standards on the sustainability and the degree of indebtedness, the standards established by the Maastricht

Treaty to ensure that any country joining the Union is fiscally responsible, and on the other hand that Member States are sufficiently "convergent" to guarantee a common monetary policy. The budgetary convergence criteria laid down in the Treaty concern, on the one hand, the impossibility of using the monetary issuance – as a means of financing the budget deficit, and on the other hand the observance of the limits of 3% of gross domestic product (for the budget deficit) and 60% gross domestic product (for public debt).

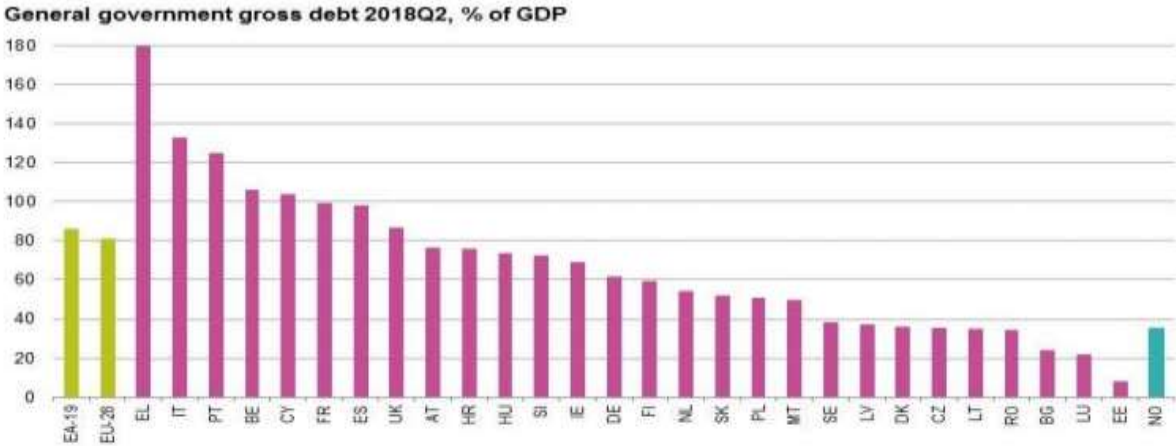
Gross domestic product growth maintains public debt, despite nominal growth, at an acceptable level out of GDP ratio. Romania has been for many years among European countries with a public debt ratio of less than 60% of GDP, the limit required by the Maastricht Treaty.

Only half of the 27 EU countries have a public debt of less than 60% of GDP. Among them Poland, Slovakia, Sweden or the Czech Republic, while Estonia (8.7%), Luxembourg (22.2%) and Bulgaria, 24% of GDP, recorded the lowest levels of public debt.

Starting with 2016, Romania's public debt began to rise, and in 2018 it simply exploded. In the first seven months of the year, the total debt reached 97.5 billion euros.

Thus, Romania's government debt, according to the EU methodology (as shown in the chart below), was at the end of 2017 at a level of 35.2% of GDP, well below the 60% superior margin set by the Maastricht Treaty. From governmental debt, at the end of 2017, domestic debt accounted for 18.1% of GDP, and external debt was 17.1% of GDP. At the end of October 2018, government debt accounted for 35.6% of GDP, of which domestic debt accounted for 18.7% of GDP and external debt was 16.9% of GDP.

According to Eurostat data, in the middle of this year, Romania appeared on the fourth position among the EU Member States with the lowest public debt, with a level reported to GDP of 34,1%. With smaller debts than us there were only Estonia (8.3% of GDP), Luxembourg (22% of GDP) and Bulgaria (23.8% of GDP). Simultaneously, if we are taking into account the evolution over the last four quarters (compared to the same quarter of the previous year), we occupy an honorable position – 12 – with a 2.9% minus adjustment, identical to the one recorded on the average of the Eurozone and higher than the – 2.4% recorded across the Union.



Source: Eurostat (gov_10q_ggdebt)



V. Conclusion

If the governments of other countries have assumed a debt increase in order to have funds to help their own savings (the huge anti-crisis programs implemented in various countries), public debt in Romania has increased because the government has borrowed massively to have money necessary for the payment of salaries and pensions.

This is the reason why many economies have already come out of recession, while we will still have to wait. Moreover, a possible shift per plus to Romania's economy in the coming quarters will not be due to the brilliant programs applied by the current Government, but only the recovery of world economy will be able to change this.

The good part of it is, on the other hand, that despite these expenditures, the share of public debt in GDP is still low, but the speed at which it grows should worry the authorities. This increase in public debt has not helped Romania's economy apart from the fact that it supported the consumption of population at some level.

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THE ANALYSIS OF RUSSIAN, UKRAINIAN AND ROMANIAN MARITIME POWER FROM THE FLUVIAL POWER COMPONENT

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Abstract:

Over time they there have made many pertinent analyzes and interpretations realistic about maritime power of the three states that have in common to the Black Sea seaside, while topics related to rivers that cross these countries was much less addressed. This article proposes an analysis of naval power of the three countries in terms of the fluvial power component by comparing the main components of maritime power, such as population, society, government, geography maritime forces and means naval (navy), maritime merchant, infrastructure, etc.

The three countries were not randomly chosen. Military balance in the Danube area has undergone significant changes in recent years. On the one hand, NATO countries of Central and Southeast Europe have improved confidence of neighboring states and on the other the crisis in Ukraine has led to translation the risk factors and threats to the Danube Delta area.

The article does not aim to highlight the differences between the three countries and to establish a hierarchy of components river them, but to determine common interests in the exploitation of rivers ensuring the freedom of inland navigation, the exit to the seas, ensuring the existence of commercial fluvial fleet, highlighting the role of military fluvial fleet to ensure the protection of the transport needs, as well as the fluvial specific infrastructure.

Keywords: maritime power; fluvial power; fluvial component; rivers and inland waters.

INTRODUCTION

Water is and will be one of the most important natural resources in the future. The way it is treated will not affect only the lives and well-being of billions persons, but will also determine national economic strategies and directions for action in many regions of the world.

Although they represent a very small part of the total amount of water on the Earth, the running waters have an important role in the world economy. Since the earliest times, the rivers have represented the main source of water, food, and internal transport between settlements. The advantage of the rivers existence in certain states has been exploited due to their potential for the development of communications, trade, water resources, and other areas.

In Europe, the large rivers such as the Volga, Danube, Dnieper, Rhine, Elbe and Rhone are designed for navigation, forming a very dense internal communications network that provides a high volume of traffic of goods and people. The rivers are also interconnected by canals, one of the most important being the Danube-Main-Rhine Channel through which a river connection has been created between the Black Sea and the North Sea. Also the

Moscow-Volga, Volga-Don and Volga-Baltic channels form a navigable network that allows the link between the Baltic Sea, Caspian Sea, Azov Sea and Black Sea.

This is how the rivers create bridges between countries, continents, seas and oceans. In this sense, for that all riverine countries, and not only, to enjoy the privileges offered by these waters, at the national or multinational level there are established legal regimes of international water courses that relate to freedom of navigation and sustainable exploitation theirs. However, when water resources are cross-border, cooperation and integrated management is a major challenge with many obstacles. There is a great potential for triggering conflicts due to water.

In this context, this article seeks to analyze the maritime power of Russia, Ukraine and Romania from the fluvial component's point of view, using the comparison method of the main components of the maritime power, namely: population, society, government, maritime geography, naval forces and means, merchant navy, infrastructure, etc.

Also, the election of the three states took into consideration the situation and the changes in the military balance of the common space of the three states in recent years. On the one hand, joining the countries of Central and South-Eastern Europe (with the exception of Serbia) led to an increase in the confidence of the states in the area, and on the other hand the crisis in Ukraine determined the transpose the risks and threat factors toward mouths of the Danube in the border area, the border with the former Soviet space.

Last but not the least, we chose this issue because, over the time, there have been many pertinent analyzes and realistic interpretations of the maritime power of the three states that have a common point - the exit to the Black Sea, while the themes like rivers that crossed these countries were much less approached.

THE CONSTITUENT ELEMENTS OF THE MARITIME POWER

The maritime power is the sum of the capabilities of a nation to implement its interests in the planetary ocean, using its vastness to develop political, economic, military, peacetime or wartime activities to achieve national goals in the field.

British Geoffrey Till identifies and details in his paper "Maritime Strategy and Nuclear Age" the following constituent elements of maritime power, widely accepted in contemporary maritime theory: navy, population, society and government, technology, maritime geography, resources and maritime economy.

These elements spring up, in his conception, from a series of sources such as: the maritime community – the mutual influence between the commercial fleet and the military fleet, the national resources, the forms of government, the geographical conditions. Without listing it as part of the maritime power sources or elements, Geoffrey Till, recalls the very important role that marine consciousness plays.

The historical evolution of universal thinking as well as studies in the field of maritime strategy highlighted the elements of the maritime power and the sources that generate them. In this sense, we consider that the elements of the current maritime power are: forces and naval means, including those of the Border Police, Maritime Aviation and Marine Infantry; the merchant navy; the infrastructure and logistics resources, including bases, ports, supply points and warehouses, shipyards, refurbishment workshops, airports, etc.; the maritime consciousness - maritime thinking and mastery, maritime educational system.

We made a brief overview of the main elements of the maritime power, not to detail this, but to use them ours analysis of the three countries' fluvial component: Russia, Ukraine and Romania.

In the general context, referring to the maritime power, we can make a delimitation of the three states in terms of "territorial power" and "maritime power". So, in the case of Russia, we are dealing with great maritime power, succeeding in promoting her interests across the Planetary Ocean and, essentially, controlling or attempting to control this Planetary Ocean. Romania and Ukraine are considered to be maritime powers as they have exit to the Planetary

Ocean, promote their own maritime interests and exercise control over the areas adjacent to their littoral. However, it is noteworthy that after the Crimean crisis in 2014, Ukraine faces great problems in exercising control, especially in the Azov Sea, given that the Kerch Strait is controlled by the Russian forces.

A comparison of the world's top 106 military powers is available on open sources¹ which provides a detailed analysis based on indicators such as military troops, ground military capabilities, military capabilities, naval military capabilities, logistics, financial strength, geography, etc. Comparing the three states we are referring to, the site has resulted in a series of conclusions and data, and the final result (GFP Global Firepower) is: Russia – 2nd place out of 106, Ukraine - 21st out of 106 and Romania – 51st place of 106.

POPULATION, SOCIETY AND GOVERNMENT, COMPONENTS OF THE MARITIME POWER

Appreciating the role of this constituent element, from the multiple commitment of the community, we could highlight what such a community can do:

- encourages maritime/river trade and calls on the government to support it;
- facilitates the development of the Navy, as this is mainly seen as a means of protecting maritime trade;
- provides direct support to the Navy by providing human resources.

At the level of 2018, the situation of the population of the three states was as follows: Russia – 145,500,482 persons, Ukraine – 44,573,205 persons, and Romania – 18,714,479 persons.

More than a third of the population of each analyzed state lives in urban and rural settlements located on the banks of the main rivers that run through these countries, and human activity causes considerable changes in natural water resources, respectively, on rivers. We can mention interventions on riverbeds that modify drainage conditions, water consumption for various human activities (drinking water supply, irrigation, etc.) that reduces water resources, economic activities that cause water pollution, etc.

We can understand the interest of states in the exploitation of the river potential, so we note that the three states have common interests in the development of waterway infrastructure and networks, but the implementation of these projects often stops at early stages. Below we will present some examples of large existing projects of the mentioned three states level. *Russia:* The Lenin Volga-Don channel is a channel that links the Volga and the Don between the points closest to one another. Opened in 1952, it has a waterway length of 101 km, with 45 km of rivers and reservoirs. The Channel is a part of the Unified Navigable Watersystem of European Russia. Together with the Lower Volga and the Lower Don, the Volga-Don Canal offers the most direct waterway link from the Caspian Sea to the Azov Sea and further on to the Black Sea and the Planetary Ocean respectively.

There is also Russia's intention to build another navigable canal that will link the Caspian Sea to the Black Sea, with the cost of the project rising to nearly 15 billion dollars. The advantages of this project are obvious because, following the construction of the Canal, on the one hand, Russia could control the export corridor between Asia and Europe, which would considerably increase its political prestige and, on the other hand, would provide a strong impetus to the states in the south of Russia.

Ukraine: The channel of great depth is a strategic objective from the point of view of Ukraine. This channel, which links the Danube to the Black Sea, crosses the natural reserve and allows Ukraine to have a waterway access to the sea. Work on this channel began in 2004. Romania urged Ukraine to stop this project, given that the new 10 kilometer connection between the Danube and the sea passes through the Danube Delta and violates a number of

¹ according to <http://www.globalfirepower.com/countries-comparison.asp> accessed at 12.02.2019.

international conventions in the field of environmental protection. Despite the numerous protests issued by Bucharest, Kiev inaugurated in 2007 the Bâstroe channel.

Romania: The draft transport master plan of Romania envisages the construction of a navigable channel between Capital Bucharest and Danube (at 430.5 km). It began as early as 1986 but construction works were stopped in 1990. At that time, only part of the hydro-mechanical equipment had been installed, the embankments and dykes were completed at about 70%, and the works of bank protection in the proportion of about 40%. Since then, no maintenance has been done to maintain these investments, which have deteriorated due to natural causes or human actions. It is expected to be completed in 2025.

Another strategic project of major importance not only for the inhabitants of the Danube but also for the entire country is the bridge above Danube from Braila which connects Muntenia to Dobrogea. As politically, this project is a viable one, which is currently underway and will be completed within four years. This will be Europe's fourth important bridge.

MARITIME GEOGRAPHY COMPONENTS OF THE MARITIME POWER

Geography has always been of crucial importance for a country's strategic situation. Alfred Thayer Mahan regarded geography as an ensemble of coastal conformation, the existence of ports, rivers, riches in the interior, proximity to important communications lines, and easy access to the Planetary Ocean.

Statistically 71% of the planet's surface is covered by water, 97% being sea and ocean, so there is little water left for commercial, industrial, agricultural and domestic use. Of the remaining three percent of the water, more than two percent are contained in the the north polar ice cap, glaciers and groundwater which are inaccessible. It is estimated that only 0.36% is found in rivers and lakes.

This shows that a very small percentage of water is in waterways, which are of great economic importance, as it crosses and connects countries, capitals, cities, urban settlements with a strong economic and military potential. In a normal year, inland waterway transport in Europe accounts for approximately 500 million tonnes of transported goods.²

Next, we will refer to the most important rivers of the three states. Among the great rivers of Russia are: Volga (3,700 km), Obi (5,410 km), Enisei (4,102 km), Lena (4,400 km), Kolama (2,129 km), Amur (at the border with China, 4,416 km).³

Main rivers on the Russia territory

The Volga River is the longest river in Europe, entirely on the territory of Russia. Volga springs from the Valdai Plateau in northwestern Moscow and has a course of 3,690 km, being the heart of the continent's largest hydrographic complex. The Volga is the 19th largest river in the world, spilling into the Caspian Sea, 88 km south of the city of Astrakhan. At spill forms a huge delta. His course is the most populated and developed region of Russia. In its course, nine large hydropower plants were built.

The Volga is considered Russia's national river and crosses 11 of the 20 largest cities in Russia. In Russia, Volga is known as the word "Bölga" which is related to a Slavic word, namely "moisture", "humidity". The most strategic turn of the Volga is when of the Volga is when it goes to Don (the largest river of Russia). Volgograd, the former Stalingrad is located here. The Volga Delta is about 160 km long and has over 500 canals and many smaller rivers. It is the largest estuary in Europe and is the only place in Russia where species of pelicans, flamingos and lotians can be found. In winter, much of the Volga freezes for about 3 months.

² according to https://ec.europa.eu/eurostat/statistics-explained/index.php/The_EU_in_the_world_-_transport accessed on 12.02.2019.

³ according to https://russia.rin.ru/guides_e/4343.html accessed on 03.03.2019.

The Volga drains almost all of Western Russia. Many storage lakes on their course allow irrigation and hydropower production. The Moscow-Volga Canal, the Volga-Don Canal and the Volga-Baltic Channel form a waterway network that allows the connection between Moscow and the Baltic Sea, the Caspian Sea, the Azov Sea and the Black Sea.

The fertility of the river valley allows the production of large quantities of wheat or other cereals. There is an important oil industry in the Volga Valley. Among the mineral resources found here are natural gas, salt and potassium carbonate.⁴

The Ob River is the river with the longest estuary: 800 km long, 30-90 km wide and 10-12 m deep, is located in western Siberia, the Russian Federation. The river springs from the Altai Mountains, through the springs of Biia and Katun, and flows in the S-N, through the vast plain of Western Siberia, as it flows into the Kara Sea - the Frozen Ocean through a huge estuary. The river has a length of 5,410 km.⁵

The Yenisey River is a 4,092 km long Siberian river, nicknamed the Siberian meridian. His course crosses the center of Siberia, from south to north, following in long the meridian of 90 °, flowing into the Arctic Sea Kara Sea as well as the Ob River. The Yenisey River originates at the edge of Kāzāl (105,931) in the Tuva Autonomous Republic through the confluence of the Great Enesis (605 km) and Little Enisai (680 km) rivers that spring from the Ostaian Mountains (3,492 m), stretching between Mongolia and Lake Baikal.⁶

Near the town of Abakan, the river Yenisey receives the affluent of the same name. In southern Abakan is the Krasnoyarsk reservoir lake, 400 km long. Between Krasnoyarsk and Minisinsk the river is navigable by means of harbour lock. To the north of Krasnoyarsk, in a depression, flows the tributary Kan (430 km).

At 60 km north of Dudinka, the Enisio flows through an estuary in the Bay of Yenisey in the Kara Sea where the masses of water produce a strong current.

The Lena River is a river in Siberia, the 10th longest in the world and has the 9th river basin in the world. It springs from 1,640 m altitude from the Baikal Mountains, south of the Siberian Central Plate, 20 km west of Lake Baikal. Lena flows to the northeast, tributaries of the Kirenga and Vitim rivers. From Yakutsk, Lena enters the lower plain, meets the Oliokma River and flows north until its waters flow from the bank of the river Aldan. The Verhoiansk mountain range deflects it northwest. After receiving his most important tributary on the left bank, Viljuj, is making his way straight to the north, spilling into the Laptev Sea of the component of Arctic Ocean, depositing his sediments southwest of the Siberian New Islands, a delta with an area of 10,800m². The Delta is crossed by several arms, the most important one being the most eastern, Bilov.⁷ The Lena River Delta is about 400 km wide. Delta is virtually a frozen tundra for about 7 months a year, but in May it turns into a lush wet region for the remaining 5 months. Part of the delta is protected as a natural reserve.

Ob in northern Siberia, Yenisei in central Siberia and Lena in eastern Siberia represent the main naval routes in the eastern part of Russia.

The Kolima River is a 2,129 km long river that flows into the Oriental Siberian Plain region in the Eastern Siberian Sea, a large Arctic Ocean periphery. The river springs to the south of the Cerski Mountains. At first it has two branches joining the southern edge of the Oimiakon Plateau. The direction of the Colima River course is from south to north.⁸

The Amur River ("The Black Dragon River") has a length of 2,824 km, the longest river in China and Russia, which flows into the northern Pacific Ocean. Since August 27,

⁴ according to <https://www.britannica.com/place/Volga-River>, accessed on 12.02.2019.

⁵ according to <https://www.britannica.com/place/Ob-River>, accessed on 03.03.2019.

⁶ according to <https://www.britannica.com/place/Yenisey-River>, accessed on 03.03.2019.

⁷ according to <https://www.britannica.com/place/Lena-River>, accessed on 03.03.2019.

⁸ according to <https://www.britannica.com/place/Kolyma-River>, accessed on 03.03.2019.

1689, the river after many political and military conflicts in the past, is now a natural boundary between China and Russia.⁹

Ussuri is a tributary of Amur's 588 km long. The river has its source in the Far East Federal District north of Vladivostok and at the southern foot of the Sikhote-Alin Mountains (2.077 m), which are coastal mountains located opposite Japan. In 1969, the Soviet Union and China had military conflicts along the border river, the reason for the conflict being the island of Ussuri. These hostilities ended in 1991, and in 1995 Russia recognizes the Chinese state's claim that it will definitively belong to Damansky Island on Ussuri by the treaty of June 2, 2005.

Main rivers on the Ukrain territory.

Ukraine is crossed by the major rivers of Eastern Europe: the Dnieper (drain 1/2 of the country's territory), the Dniester, the Southern Bug. In the east Donetus (the tributary of the Don) crosses an important carboniferous basin of the world (Donbass), and in the Carpathians its Tisa, Prut and Siret springs. In the south-west, Ukraine has an exit to the Danube.

The Dnieper River (also Dnepr, Dniapro, Dniepr or Dniipro) is a 2 290 km long river flowing from Russia and flowing through Belarus and Ukraine before it is poured into the sea. Its length is the third river in Europe, after the Danube and the Volga. The waters freeze in winter and spring. Dnieper springs from the Central Russian Plateau and flows into the Black Sea. It is in an area with a continental climate.¹⁰

Dniester is a river that springs in Ukraine near the border with Poland and flows into the Black Sea. On a short stretch marks the border between Ukraine and the Republic of Moldova, after which it enters the Republic of Moldova. On its left bank lies the separatist region of Transnistria, and then the river becomes again a border between Moldova and Ukraine before crossing Ukrainian territory. It flows into the Black Sea through the Nistru River, on the Ukrainian territory.¹¹ Among other things, Dniester is used for fishing, freight transport and electricity generation. It has a length of 1,362 km, of which 500 km are navigable, the height of the spring is 1,000 m, the multi-annual average flow is 310 m³ / sec and the surface of the hydrographic basin is 72,100 km².

The South Bug or the Bug is a river entirely located in Ukraine. At its mouth there is the Olbia Hellenic colony. The length of the water course is 806 km. Point of discharge-Black Sea.

The Donet River is a river in the southern part of the Eastern European Plain. It springs from the Russian Central Plateau, north of Belgorod, and unites with the Don River, about 100 km from the Azov Sea. The Donet River is the fourth largest river in Ukraine and is an important source of drinking water in the east of the country.¹²

Main rivers on the Romania territory.

The Danube is the second longest of Europe's rivers (after the Volga), being the only European river flowing from west to east. It springs from the Black Forest (Germany) in the form of two rivers called Brigach and Breg that spring from Kandel peak (1241m) and unite in the town of Donaueschingen (altitude: 678 m) in the Fürstenberg castle courtyard. The German name of the river is Donau. The Danube flows south-east on a distance of about 2,860 km to the Black Sea. The Danube Delta was formed when the river was shed in the Black Sea.¹³

The Danube is an important international river road, flowing through 10 countries (Germany, Austria, Slovakia, Hungary, Croatia, Serbia, Romania, Bulgaria, Moldova,

⁹ according to <https://www.britannica.com/place/Amur-River> accessed on 03.03.2019.

¹⁰ according to <https://www.britannica.com/place/Dnieper-River> accessed on 04.03.2019.

¹¹ *Idem*.

¹² according to <http://www.encyclopediaofukraine.com/display.asp?linkpath=pages%5CD%5CO%5CDonetsk.htm>, accessed on 04.03.2019.

¹³ according to <https://www.britannica.com/place/Danube-River> accessed on 04.03.2019.

Ukraine) and has tributaries in seven other countries. It passes through four state capitals: Vienna, Bratislava, Budapest and Belgrade.

Due to the geographic location on the continent of the Danube river basin, the contact between the temperate-oceanic climate in the west, temperate-continental in the east and the Baltic influences in the north, the hydrological regime of the Danube is characterized by the existence of significant variations in level and flow in the course of the year and over time.

The lengths of the Danube shores divided by country are: Germany: the right bank 678,6 km, the left bank 687,0 Km, Austria: the right bank 357,5 km, the left bank 321,5 km, Slovakia: the right bank 22,5 km, the shore left 172,1 km, Hungary: the right bank 471,2 km, the left bank 275,2 km, Croatia: the right bank 137,5 km, Serbia: the right bank 449,9 km, the left bank 358,0 km, Bulgaria: the shore right 471,6 km, Romania: the right bank 354,1 km, the left bank 1050 km, the Republic of Moldova: the left bank 0,6 km, Ukraine: the left bank 79,60 km.

The lower course runs in Romania at a distance of 1,075 km between the localities of Baziaș and Sulina, crossing the border with Serbia (235,5 km), Bulgaria (469,5 km), Republic of Moldova (0,6 km) and Ukraine (53.9 km). There are a lot of settlements in the Danube River, among which 18 cities (Moldova Nouă, Orșova, Drobeta-Turnu Severin, Calafat, Corabia, Turnu Magurele, Zimnicea, Giurgiu, Oltenita, Călărași, Fetești, Cernavodă, Tulcea and Sulina) roads and three railways.

At the Black Sea discharge, the Danube divides into three arms, thus forming the Danube Delta, the Chilia arm, Sulina and Sfântu Gheorghe arms.

The Chilia arm: The first bifurcation is near Tulcea, where the Chilia arm is heading north, with the largest length (120 km) and the flow of about 60% of the total. At its discharge into the sea, there is a secondary delta, which has three secondary branches: Tataru, Cernovca and Babina, which are now in the territory of Ukraine.

The Sulina arm: This arm is the shortest (only 64 km), being straight, regularized and channeled, used for navigation, after deepening and correcting some meanders. Following these works between 1862 and 1902, the length of the arm fell from 93 km to 64 km, and the volume of spilled water doubled (18% at present), the minimum depth being 7 m, and the a maximum of 18 m.

The Sfântu Gheorghe arm is the second largest (108 km), advancing to the southeast. To the south, there are two channels that connect with the Iancina basin. Sfântu Gheorghe is the oldest arm, carrying 24% of the volume of water and alluviums. The largest depth on this arm is 26 m. And this arm has undergone transformation by cutting a number of six meanders, its length being shortened to 70 km.

As a conclusion on the geographic component, we can state that all three countries are at parity when referring to flowing waters and especially to rivers that cross. Consideration must be given to the benefits these waters offer in view of the hydrological, navigational and transport potential, water supply, feed, hydropower and irrigation potential. Of course, besides the advantages there are a number of disadvantages, the most important being related to the floods that occur frequently in the rainy seasons.

THE FLUVIAL FLEET COMPONENT

Although the maritime power comprises a number of components, the manifestation of its presence and action is made by the most active and visible: the navy and the commercial fleet. In a similar way we can consider that the fluvial power is composed of some components, which the most visible is the fluvial fleet. In our opinion the fluvial power is composed of forces and naval means, including those of the Coast Guard, Marine Infantry; the fluvial merchant navy; the fluvial infrastructure and logistics resources, including fluvial bases, ports, supply points and warehouses, shipyards, refurbishment workshops; the consciousness, thinking and the fluvial-maritime educational system, fluvial organizations and other fluvial specialized agencies.

In the framework of the military fleet, the fluvial component plays an important role. In this respect, we will analyze the fluvial forces of the three states in view of the level of access to this type of information. It should be mentioned that the development of the three states' fluvial forces as well as their reorganization constituted a permanent preoccupation at the policy - military level.

Missions to fluvial forces can be multiple and tailored to the needs of the moment. At the same time, fluvial forces can be a credible and desirable partner both in partnership activities, but also in actions to impose and maintain peace, to impose the embargo, to monitor fluvial traffic, to control and inspect ships suspected of illegal activities in humanitarian or search-rescue actions.

THE RUSSIAN FLUVIAL FORCES

Russia has organized fluvial forces in river flotillas or lakes. These are large units created in river basins or in the big lakes where they usually carry out fighting activities in cooperation with land troops. In 2006, Russia had about 120 river and patrol ships in the following class of ships: *Tsaplya* patrol class - 10 ships (150 t); *Yakta* patrol class - 11 ships (100 t); *Merkuriya* patrol class - 2 ships (75 t); *Kulik* kraft patrol class - 17 ships (54 t); *Zhuk* class patrol - 45 vessels (40 tons); *PO-2* kraft patrol class - 15 ships (38 t); *Mustang* kraft patrol class - 2 ships (35 t); *Saygak* patrol class - 20 ships (13 t); *Yastreb* patrol class - 5 ships (10 t).

Russia also holds 101 monitors and shore-based vessels on Amur and Ussuri that belong to the Navy.

THE UKRAINIAN FLUVIAL FORCES

Initially, the Ukrainian Fluvial Flotilla was built on the structure of the former Brigade Fluvial 116, which was fully taken over (ships, barracks, infrastructures) from the Soviet Fleet of the Black Sea and joined the Ukrainian Military Maritime Forces.

It has the structure of a brigade probably composed by two division of battle ships (a division of patrol ships, a division of minesweeper) and a division of auxiliary ships.

In addition to these units, the composition of the fluvial brigade may also include a unit (subunit) of fluvial traffic safety, subunits of communications, engineers, anti-chemical protection, subunits and material assurance structures, technical, medical and financial structures.

The Ukrainian Fluvial Flotilla was located on the left bank of the Chilia branch, as follows: Headquarters of the Fluvial Brigade (Izmail); headquarters of patrol ship squadron (Reni, subsequent probably moved to Izmail); headquarters of the minesweeper squadron (Chilia). The Headquarter Fluvial Flotilla is currently at Odessa.

The composition of the battleship squadrons is classical (12-18 ships) of which probably two-thirds of them are operable, and 1/3 are in conservation or repairs. The Ukrainian Fluvial Ship on the Danube River can be deployed in the Chilia and Izmail ports.

As a result of the process of restructuring / reorganization of the fluvial flotilla, part of the Naval Forces ships flew to patrol border guards. At present, 21 river patrol boat and gunboat are based on the Chilia branch in the Chilia and Izmail.

According to the UNIAN press agency, quoting the Ukrainian Defense Ministry press department, in 2012 it was decided to set up the Naval Navy Division of the Ukrainian Navy in Odessa and the ships of this division to be based in the Western Port, the Ukrainian naval base. Commander of the Naval Base, Captain II of Rank Igor Zaitsev said that the fluvial ships of the division will perform missions in the border waters, as well as in the lakes and near the coast.

Modernized project of Gurzau-M ship belong Ukraine Navy began to be built in Leninsk Kuznya in October 2012. Initially it was planned construction of new such ships by 2017. In December 2013, the Ministry of Defense has withdrawn the contract. In the summer of 2014, the Gurza-M project was revived and in december 2016 the first two Gyurza-M

officially joined the Ukrainian navy. The new military contract is for 20 ships that should be completed by 2020.

Gyurza-M are the most modern Ukrainian patrol craft, capable of operating both on the river and at sea, and equipped with a 30 mm automatic cannon ZTM-1, a 30 mm automatic grenade launcher KBA-117 AG-17), a 7.62 mm PKT machine gun and two Baryer anti-tank missiles with a maximum radius of 5km and SAL guidance. It should be noted that two of these vessels were detained together with a Ukrainian tug and were seized on November 28, 2018 by the Russian naval forces as they tried to pass through the Kerch Strait in the Azov Sea.

THE ROMANIAN FLUVIAL FORCES

At present, the situation of the fluvial forces is as follows: The River Flotilla with headquarters in Braila, subordinated to: 1 gunboat squadron consisting of 3 monitors and 5 armored stars, 1 river patrol boat squadron with 12 ships and 1 maritime infantry regiment

Also for the logistic support are meant 2 logistic units deployed to Braila and Tulcea respectively. It is noteworthy that as of 2017, with the increase in the defense budget, the fluvial ships have begun a major project to modernize on-board techniques and weapons.

MARINE AND COMMERCIAL ECONOMY COMPONENT

It is well known that 75% of world trade is by sea. Transport to rivers and on rivers is equally effective. The fluvial transport is the cheapest way of transport. According to the tariffs in force, the fluvial transport is about 2-3 times cheaper than the rail and much cheaper than the air or terrestrial transport.

The economy of fluvial transport is primarily due to the high capacity of the fluvial transport. Thus, while a nine-barges convoy of 1500 tons each can carry 13,500 tons of freight, a train lining with 18 wagons of 25 tons each, can carry a quantity of goods 30 times less. This means, of course, lower expenditure on the freight unit transported and therefore lower rates compared to rail or car transport.

Secondly, the higher economy of the fluvial transport is also due to lower investment expenditures for the development of their infrastructure compared to rail or car transport infrastructure. The fluvial waterways are natural paths that do not usually require costly landscaping, and ports are usually built in those places that offer the most favorable natural conditions.

In the new geopolitical context, knowing that the economies of the developed countries are resource dependent and their need constantly increasing, one can easily see the major importance of fluvial transport. The longest inland navigation networks belong to the Russian Federation (145,000 km), followed by those in Ukraine 2,150 km and those of Romania (1,731 km).

In setting up economic development programs, the governors will have to take into account the importance of training, existence and maintenance of a suitable commercial tonnage commercial fleet able to achieve the volume of trade that contributes to economic development and, implicitly, to the welfare of citizens. However, over the last 20 years, the construction and revitalization of river transport vessels has been almost non-existent in all three states. There has also been a decline in the number of regular passenger ships between cities on the shores of waterways.

Ukraine has favorable natural conditions for the development of water transport: access to the seaside, with the possibility to create ports (in bays, estuaries); the presence of rivers that provide access to the sea to the largest industrial areas and the capital (Dnieper) and connects Ukraine with the European network through the Danube River. The fluvial transport ensures the transport of goods and passengers to a large extent within the country and in small quantities - the transport of interstate goods.

The Ukrainian side of the Trans-European Danube Road has become quite profitable for international transport since after the development of road infrastructure to the Danube. In

the past, the international transport was largely done on the Romanian side. In 2019, it is planned to restore the fluvial transport.

All three analyzed states have fluvial vessels for the fairly old commercial transport. The river navigation is practiced with ships and barges from 500 tdw to 5,000 tdw, with which convoys are made, in some cases with ships up to 10,000 tdw.

If, before 1990, more than 90% of the fluvial fleet was engaged for domestic transport, after 1990, due to the economic recession in Romania, the fluvial shipowners were oriented towards the transportation of goods in transit, so that over 70% of the transport capacity was used for international freight transport, both for Romanian export/import goods and for freight transport from Constanta port to central and western European countries.

During the Yugoslav civil war of 1992-1995, the fluvial fleet was affected by the economic embargo imposed on Yugoslavia, which led to the loss of about 50% of the international freight traffic on the Danube. Later the conflict in Kosovo represented the total fall of international transport on the Danube, because of the three bridges across the river were bombed in the Novi Sad area, thus completely disrupting the navigation on the Danube. The international context, both during and after the conflict, has made it impossible to resume navigation on the Danube, which has been partially interrupted for more than two years.

The worst is that, in large part, the traditional traffic of goods that transported on the Danube has taken other routes, so goods that have to reach the countries of Central Europe, have as their entry ports Rotterdam (using the RinMain channel - the Danube) and the Adriatic ports: Koper and Rijeka.

INFRASTRUCTURE AND LOGISTICAL RESOURCES

Infrastructure and logistical resources are essential elements of maritime power. In the same way, we can consider that the fluvial infrastructure and the related logistic resources are elements of the fluvial power.

The fluvial bases, ports, yards and warehouses with all their capabilities and facilities provide the necessary mobility for the river flotilla and commercial fleet, ensure the stability and reliability of the fluvial system and all these, together with the special, technical and auxiliary fluvial fleet, are designed to increase the autonomy of fluvial ships and ensure safe fluvial navigation conditions.

Let us not forget to refer to the hydrographic and navigation fluvial systems (headlights, navigation lights, radios, specific books and directories, radionavigation systems, global positioning systems, navigation systems, etc.) that facilitate safe ship movements and significant reduction of risks.

Russia has river ports in the main settlements on the banks of the waterways. Ukraina has ports on the Danube, Chilia Nouă, Ismail, Reni and Vilcov, ports on the Dnieper, Smolensk, Worscha, Mahiljou, Kiew, Tscherkassy, Kremenschuk, Dnipropetrowsk, Saporischja, Nikopol and Cherson. In April 2007, the Bastroe Canal¹⁴ - the Danube-Black Sea Canal channel, which operates at maximum capacity, was put into operation. The Ukrainian part, which maintains strict situation of the goods traffic on the Romanian channel Sulina, comparing the result with the situation on the Bastroe of the Danube, announced that the Ukrainian variant is preferred to the Romanian one. Since early 2009, the Ukrainian channel has exceeded the Sulina channel after the number of crossings, considering that unlike the Sulina Canal, Bastroe travel is in both directions, including at night. In addition, the rates are lower and the payment conditions are simpler. It was normal to be so, since Bastroe is a natural channel, whose design only involved the enlargement of the navigation space and the consolidation of the banks.

¹⁴ according to <http://incomemagazine.ro/articles/canalul-bastroe-a-detronat-sulina>, accesed on 12.02.2019.

Romania has the 28 Danube ports, Danube Delta ports and Danube-Black Sea ports. The river and river-to-sea ports have quays, equipped with loading, unloading and transport capacities to allow for the disembarkation of personnel and military equipment (light and heavy armaments, ammunition, armored conveyors, tanks, etc.) and also, its have the possibility of water and energy supply, can ensure the supply of food and fuels. Some of the ports have shipbuilding and ship repair yards and Drobeta Turnu Severin, Brăila and Tulcea have sections specialized in military ship repair and construction.

The Danube's waters are used for electricity generation, irrigation systems in the Romanian Plain and Dobrogea, for supplying potable and industrial water to the cities, ensuring fishing and a remarkable tourist potential. But the most important use is the transport of goods. At the same time, toward Danube "gravitating" even more areas remote, directly or indirectly, through the regional and continental hydrographic network (Rin-Main-Danube system). This particular regional unit, the Danube, has an adjacent space of direct influence, which can be considered very important for the region.

Conclusions

From a brief analysis of the importance of the rivers for the three states analyzed in this article, it follows that from the point of view of the geographic component, these have the first three rivers in Europe as length, Volga, Danube and Nipru. Besides the geographical dimension, the determinants of fluvial power are economy, fluvial infrastructure and resources, the population and the fluvial forces that together contribute to the idea that the rivers are a source of both economic and military power. Thus, referring only to the fluvial component, we can consider that Russia, Ukraine and Romania represent fluvial powers.

As we mentioned, the naval power is a component of maritime power. The most visible element of the maritime power is the maritime fleet. In the same way, we can consider the fluvial fleet as the most visible component of the river power.

However, because maritime power is a consecrated concept and sums up a number of components, the most visible of which are the naval forces, then we can assume that the fluvial power, which is a particular element of states with river capabilities, contributes to the strengthening of the maritime power.

This shared advantage of the three states, which are fluvial power, gives them the opportunity to strengthen the maritime power they own.

Finally, We find it difficult to establish a hierarchy of the fluvial power components which constitute the fluvial power of the three states as the constituent element of the maritime power are found in each of these states. Their importance is different and the comparison grid is not clearly defined. We can say, however, that Russia, Ukraine and Romania have common interests in the exploitation of rivers, ensuring freedom of navigation on inland navigation routes, ensuring an exit in planetary ocean, a military and commercial fleet to meet transport needs and protection and the existence of specific infrastructure on the rivers.

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CURRENT ASPECTS OF THE PARTICIPATION OF THE MILITARY POLICE SERVICE OF THE MINISTRY OF DEFENSE OF THE REPUBLIC OF BULGARIA IN PEACE SUPPORT OPERATIONS

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Abstract:

Contemporary military conflicts are accompanied by a significant number of civilian casualties, which brings to the forefront not only the need to neutralize the enemy but also to protect the lives and health of citizens. Careful consideration and reconsideration of methods and methods of conflict resolution are needed. The possible solution is the reconciliation and use of military and police capabilities.

The Military Police Service is one of the most appropriate tools of the arsenal available to the Armed Forces of the Republic of Bulgaria for the efficient and effective execution of tasks in providing military and civilian missions and operations.

Keywords: *Peace Support Operations; Resolute support; application of force; advising; military police; mentoring.*

Today's world events mandate a need to project all available and legitimate methods to enable our war-fighters and leaders to effectively deal with a host of traditional as well as nontraditional threats and the newest challenges. Now, more than ever, the minimal level of tolerance for collateral damage and loss of human life, coupled with the tendency for the typical enemies to exploit the rules of engagement (ROE) to their benefit, necessitates an effective and flexible application of force.

1. Law foundations

Law foundations are based on two General principles of PSO.

a. All military (and military police) operations must comply with the principles of distinction, prohibition of unnecessary suffering, and humane treatment.

b. Military necessity has already been taken into account in the formulation of these rules. Therefore, where not mentioned explicitly as an exception to the rules, military necessity cannot serve as a justification for their violation.

These principles are based on customary international law. They are derived from the fundamental tenet that the right of belligerents to choose methods or means of warfare is not unlimited. This tenet was expressed in the 1874 Brussels Declaration⁷ and the 1880 Oxford Manual. It was first formally codified in the 1899 Hague Regulations, and reaffirmed in the 1907 version thereof. It subsequently appeared in Additional Protocol I,⁹ as well as other instruments, such as the 1980 Conventional Weapons Convention, Inclusion in the Conventional Weapons. The Convention is of particular relevance in light of the 2001 extension of the entire agreement to non-international armed conflicts. Thus, it represents the first treaty acknowledgment of the tenet in the context of such conflicts.

According to these principles the following Capstone Documents have been created. They establish the framework for the conduct of PSO.

- 1949 Geneva Convention Relative to the Protection of Civilian Persons in Time of War;
- 1980 Protocol III on Prohibitions or Restrictions on the Use of Incendiary Weapons to the UN Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May be Deemed to be Excessively Injurious or to Have Indiscriminate Effects;
- 1980 Protocol II on Prohibitions or Restrictions on the Use of Mines, Booby-Traps and Other Devices to the UN Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which CCW PII 68 May be Deemed to be Excessively Injurious or to Have Indiscriminate Effects;
- 1989 Convention on the Rights of the Child;
- 1993 Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction;
- 1995 Protocol IV on Blinding Laser Weapons to the UN Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May be Deemed to be Excessively Injurious or to Have Indiscriminate Effects;
- 1996 Amended Protocol II on Prohibitions or Restrictions on the Use of Mines, Booby-Traps and Other Devices to the UN Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May be Deemed to be Excessively Injurious or to Have Indiscriminate Effects;
- 1997 Ottawa Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti- Personnel Mines and on their Destruction;

Documentary analysis gives us opportunity to develop a short list of generally prohibited weapons. Using the following weapons is absolutely forbidden:

- a) Poison and poisoned weapons;
- b) Biological and bacteriological weapons;
- c) Gas, and other chemical weapons, including riot control agents when such agents are used as a method of warfare;
- d) Exploding anti-personnel bullets;
- e) Weapons that mainly injure by fragments which escape detection by x-rays;
- f) Laser weapons designed to cause permanent blindness.

Moreover, the following restrictions on the use of specific weapons are established also:

1) *Booby traps*

It is forbidden to use booby-traps in connection with objects entitled to special protection or with certain other objects likely to attract civilians. It is also prohibited to use booby traps in any city, town, village, or other area containing a concentration of civilians in which combat between ground forces is not taking place or does not appear imminent, unless they are placed on or in the close vicinity of a military objective or measures are taken to protect civilians from their effects.

2) *Land mines*

All feasible precautions must be taken to protect civilians from the effects of land mines, especially anti-personnel land mines.

3) *Incendiary weapons*

In the use of incendiary weapons, particular care must be taken to avoid, and in any event to minimize incidental loss of civilian life, injury to civilians, and damage to civilian objects.

All of these limitations and specifics for the PSO make them separate area of military knowledge. It demands not only finding new approaches of conducting operations but also it enforces implementation of new methods of individual and unit preparation, creation of new

Tactics, Techniques and Procedures, including new equipment and non-lethal weapons (NLW). Much like a rheostat switch in which power can be dialed up or down as desired, NLW provide tools to allow a commander to employ sufficient force to accomplish an objective without requiring the destruction of the enemy or the habitat. The intent of employing NLW is not to add another step in the progression of escalation with an adversary, but to add another tool to use anywhere along that continuum.

This new area of responsibilities and tasks also requires a new level of relationship between government and non-government players on the global stage of research, development, production and trade of knowledge and products of military and security industry.

The Republic of Bulgaria, as a member of NATO and the EU and as a party to the founding treaties of the two unions, is bound by the values set out therein and is obliged to conduct internal and foreign policy according to them. What is important, however, is not their formal acceptance as part of national legislation, but their practical application and assertion, both in the country and on the international scene.

As part of the National Security System, the Military Police Service actually applies this legislation. I can start with the normative framework in a national aspect, first of all, to focus on the Counter-Terrorism Act, according to which the Military Police Service and the Armed Forces of the Republic of Bulgaria participate in countering and overcoming the consequences of terrorism in accordance with the plans drawn up. Indeed, it is a comprehensive, multi-national activity with unified leadership, financial and resource provision and decentralized implementation under constant and effective coordination between state and local authorities and structures.

Next are the Law on the Management and Functioning of the National Security Protection System and the Crisis Management Act. Crisis management is a complex of activities of competent authorities aimed at preventing the emergence and development of crises and their management. In the event of a crisis occurring in the territory of another country with immediate effect in the country, the competent authorities shall take the necessary action, unless otherwise provided in an international treaty to which the Republic of Bulgaria is a party. It is also worth mentioning here the Council of Europe's Critical Infrastructure Protection Directive 2008/114 / EC.

Last but not least, the Defense and Armed Forces Act, which includes the main aspects of national security and defense, including crisis management and peacekeeping operations, must be addressed.

The activities and powers of the Military Police Service and its interaction with state authorities, security services and public order are regulated by the Military Police Act. Any normative basis, even if perfect, would be a simple text if, after its creation, no action is taken on its implementation, by building up the necessary capabilities and creating opportunities for their realization.

2. Specific aspects of the military police service in PSOs

The Military Police Service takes part in the Alliance's peacekeeping operations, as the peculiar aspect is that they are not covered by Article 5 and are being implemented in a territory devoid of fully functioning civilian institutions that can contribute to effective conflict prevention and are actively involved in crisis management, including crisis response operations.

The 2025 Strategic Vision of the Bulgarian Military Police Service for Peacekeeping Operations is focused on the Alliance's Strategic Concept on Interaction between Forces and the Civilian Environment (Both Governmental and Non-Governmental)

The Bulgarian Military Police Service is an important and flexible tool for solving these complex tasks. Raising the level of military training and participating in joint exercises will increase the contribution of the Military Police Service to NATO and EU missions and operations.

The spectrum of domestic and international activities will be enhanced by the acquisition of new capabilities, the most important of which are the following:

- the use of official dogs to detect explosives and narcotics;
- the use of biometric identifiers for persons;
- control and administration of military identity documents;
- control of arms and weapons of mass destruction in the armed forces outside the areas of military formations and structures;
- registration and reporting of military vehicles;
- Participation in Stabilization and Reconstruction Operations;
- Adaptation of NATO standards, procedures and terminology to the work of the Military Police Service.

Since the beginning of the participation of the Bulgarian military in missions abroad, the Military Police Service sent their representatives in the Bulgarian contingents. The basic rule in multinational operations is to conclude treaties on the exclusive jurisdiction of members of the multinational force, so that countries participating in the operation take responsibility for investigating the case and require criminal prosecution of their members who have committed an offense or crime in a foreign country. In this regard, only the Bulgarian military police can take over the investigation of accidents and crimes committed by Bulgarian troops abroad. Therefore, regardless the manner of Bulgarian military unit participating in operations and missions abroad, it must have representatives of the military police in its ranks to ensure the rule of law and security. In addition, military police is one of the best and most trained units to carry out missions abroad, especially in the post-conflict period, when mainly military police actions are performed.

Currently, members of the “military police” are actively participating in missions abroad to NATO-ISAF in Kabul and Kandahar, Afghanistan, to the European Union - Europol Kabul and Altea operations in Bosnia and Herzegovina, as well as in the UN mission to Liberia. So far, the service has participated in operations and missions abroad in Iraq, Bosnia and Herzegovina, Macedonia, Ethiopia and Eritrea, Georgia and Cambodia.

Military policemen support the NATO Commander in his Coordination and Co-ordination duties, including civilian actors, including national and local authorities, as well as international, national and non-governmental organizations and agencies. This includes:

- Support to the Mission Forces. Any activity designed to create support for the military force from within the indigenous population.
- Civil-Military Liaison. Coordination and joint planning with civilian agencies in support of the mission.
- Support to the Civil Environment. The provision of any of a variety of forms of assistance (expertise, information, security, infrastructure, capacity-building, etc.) to the local population in support of the military mission.

Comprehensive peace agreements and assistance in laying the foundations for sustainable peace require a wide variety of complex tasks, from helping to build sustainable institutions of governance to a stable security system. All of these specifics make PSO “**Multi-dimensional**”. This results in a necessity to include administrators, economists, police officers, legal experts, electoral observers, human rights monitors, etc. Extraneous experts’ participation in PSO is a new challenge not only for commanders, planning groups and executors, but it is also a challenge for MoD sections and entire security system, because of:

- differences between civil and military systems and organizational culture;
- differences between procedures;
- differences between communication capabilities and abilities;
- differences between equipment;
- differences between personnel training;

- OPSEC requirements;
- Force protection requirements.

The accomplishment of effectiveness and efficiency on that “Multi-dimensional” level of operation could be impossible without a new level of government multi-sectoral cooperation. Furthermore, it requires a new level of government-business attitudes. We have to try to establish net-centric principles in our organizational structure and culture:

- flexibility;
- real-time information sharing and exchange;
- high-speed transformation capability;
- command authority transfer from the core to any periphery element (and restoration), without any functional problems.

At the same time we should accept new models of preparation, as well as join experts from civil and business sphere.

If we accept that the PSO timeline starts from the mission beginning and ends to the real transfer of authority to the local security forces, we may separate three main phases:

- active phase;
- passive phase;
- transition phase;

During the active phase, peace keeper’s activities are offensive. In accordance with the necessity of establishing the control in the area of responsibility, PSO forces should take an active position and all measures to ease the tension. This phase may include:

- **Establishing and Managing a Cease-fire** – Cease-fires normally depend on a clear geographical delineation and an agreed time scale for their implementation. However, in more volatile circumstances, and when forces are intermingled, the best that may be achieved could be a cessation of hostilities and a withdrawal to camp.

- **Interposition Operations** – A PSO force can be deployed as an inter-positional force as a form of trip-wire, either when consent exists or when consent is fragile. Troops deployed in interposition operations are generally deployed to pre-empt conflict due to size of forces needed.

- **Disarmament, Demobilization and Anti-mine actions** - This may include securing of disarmament and cantonment sites; and/or the collection and destruction of weapons, ammunition and other materiel surrendered by the former combatants. It includes emergency mine action assistance, as well as developing medium- and long-term mine action plans.

During the passive phase, the peace-keepers’ activities are defensive. Applying the force has to be provoked by any of the opposite forces, law or agreement violators, etc.

- **Supervision of Truces and Oppression of fire** – Military forces may be deployed to supervise any commitments agreed to the parties as part of a truce, cease-fire or other peace plan. This may include operational level joint force deployments. Tasks will generally be agreed and specified in detail in the agreement or treaty.

- **Restoration of Law and Order** – Operations designed to restore or to maintain the peace will generally be necessary in the circumstances of chaos associated with a conflict and when there are no coherent parties, or the parties are ill-disciplined and indistinguishable from the criminal elements of the local society.

- **Observation and Monitoring (continues in transition phase)** – They may be conducted by strategic and operational maritime and air assets, including satellites, but ultimately will rely heavily on the human factor, i.e. observers on the ground. Typically used when forces are limited. “Eyes and Ears” of the Security Council.

- **Humanitarian Relief** – Humanitarian relief is conducted to alleviate human suffering, especially in circumstances where responsible authorities in the area are unable or possibly unwilling, to provide adequate support to the population.

- During transitional phase the main goal is the effective transfer of authority and responsibility to local security system and its independent functioning. The phase may include the activities below. At the same time any functions started in previous phase may continue.

- **Protection of Humanitarian Operations and Human Rights** – The foremost task for the military force may be to restore the peace and create a stable and secure environment in which aid can run freely and human rights abuses are curtailed. Non-combatant Evacuation Operations (NEOs), protection of convoys, depots, equipment and those workers responsible for their operation.

- **Transition Assistance** – It refers to all forms of military assistance for a civil authority or community, which are rendered as a part of a wider diplomatic, humanitarian and economic strategy to support a return or a transition to peace and stability.

3. Types of preparation and training

The variety of tasks requires preparation in the service to be conducted in several directions: preparation of the specialized units of the "Military Police" Service for Counteraction to Terrorism; military police training; participation in courses, exercises and joint training, etc.

The Military Police Service has a specialized unit whose staff are able to solve tasks in high risk conditions and imminent danger to life and health, according to the specific operational and tactical situation both on the territory of the country and during the participation in peace keeping operations. In the course of their preparation, the employees participated in a number of international exercises and joint preparations, among which I can mention: that with the US Navy and SBO - MoI on the territory of Sofia and Sofia district. Sofia; the Counterterrorism Company of the 10th US Special Forces Group, the SBO - MoI and the 68th Brigade; the national teachings "Anti-Thor" in parallel with the MoI's force structures (SBO, GDBOP, SDRD and OD - MI) and the 68th Brigade; training with the Air Force forces in the Krumovo airbase.

Every year there is also a military police exercise "Beyond the Horizon" of Novo Selo NP, Sliven, where tasks related to the participation of the personnel in peacekeeping operations are carried out. Vocations include the Military Police, Counter-Terrorism Groups at the Regional Offices, Romanian Military Policemen, experts and instructors from the General Directorate for Gendarmerie at the Ministry of Interior. The aims of the exercise are to increase the capabilities of the Military Police Company when participating in international operations and to align the tactics, techniques and procedures within the service with those of the Ministry of Interior.

Taking into account the specifics of the tasks and activities that the Office performs, the experience, the foundations and the teachers of similar structures and military educational institutions - BA "GS" are used for the training and preparation of the personnel. Rakovski "NSA" Vasil Levski ", Academy of the Ministry of Interior, NGO and others.

Internationally, the Military Police Service works closely with the NATO military authorities, the Center for the Improvement of the Police Force for Stability in the Republic of Italy and the Military Police Center to improve NATO in the Republic of Poland.

Due to the fact that Bulgaria joined as a participant country in the Military Police Center for the improvement of NATO in Poland and in order to increase the efficiency, interoperability and development of the capabilities of the Bulgarian military police, a military officer was appointed Head of the Training and Training Department by the service. Key areas of work are: developing doctrines, concepts and conducting research, training and preparation, analyzing and learning lessons and consulting. Here, it is worth noting that in 2016 the Military Police Doctrine (PP-3.16) was developed and adopted, setting the basis for planning, conducting and managing the participation of military forces in operations.

The above risks, threats and challenges, along with the various tasks assigned to the service, require effective staffing. Staffing and raising the level of staff training are the directions in which development opportunities should be sought. It is necessary to undertake activities to ensure the needs of well-trained and trained specialists and their retention through effective employment and social policy.

In conclusion, for its 25 years of development, the Military Police Service has established itself as an authoritative and non-alternate structure, which besides being a loyal and permanent partner of the leadership of the Ministry of Defense and the Bulgarian Army in the Republic of Bulgaria, has built authority as a reliable and an effective tool for counteracting and resolving crises. The striving is the core capital of the OHR - that its employees be formed and trained through good leadership, vision and will for change and development to be able to meet the challenges of multi-directional and rapid changes in the modern integrated environment security, which necessitates a rapid and timely response to the system by structuring the main process of its activity in a continuous training curve. It requires the development of new strategies and detailed reporting of changes in the security environment. It is necessary to apply an active approach requiring working in a preventive regime, i.e. not to wait for the risk to take place, but on the basis of monitoring, preparation, analysis, evaluation and forecast to react in advance.

This will allow the Military Police Service to properly approach security environment changes on the basis of information-provided solutions.

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MOBILITY IN INTERMEDIATE OPERATIONS

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Motto: "If you can find a path with no obstacles, it probably doesn't lead anywhere."

Frank A. Clark

Abstract:

The engineer branch, through its works made for the benefit of the fighting forces and the support given to them by the specialized engineer forces, constitutes in most modern armies an essential component of great importance in the military actions carried out by all the forces of the army, as illustrated by the military modern conflicts.

Keywords: mobility; engineer support; intermediate operations; overcoming obstacles.

Nowadays, in an increasingly globalized world, the old defense system at the border of state borders has somehow lost its value, the need for the display of national will and state interests at global level, within alliances capable of ensuring security. Interconnection, connection and synchronization, both technologically and procedurally, represent for the national defense system a challenge since the first manifestations of Romania's intention to join the NATO structures¹.

The term "intermediate operations" appeared in the Romanian military vocabulary in the middle of the last decade as a need in the process of elaborating new doctrines and manuals, in the desire to align them as much as possible with the provisions of doctrines and textbooks for speaking the same language with the armies of NATO member states. This replaced another concept, known as associated military actions, used over a long period of time, but also the one used less frequently - transition phases - which is the direct translation of the phrase transitional phases in NATO doctrines. Although, in general, it expresses the same thing, the formulation of intermediate operations seems to be more appropriate to the Romanian military language and to the reality expressed in the sense in which this concept is used. Intermediate operations cannot be strictly delineated from specific operations or from the stability operations, as they are executed precisely to fulfill their purpose, decisively influencing their ultimate outcome.

Intermediate operations are the actions performed by the forces before, during and after the completion of operations specific to the armed struggle or stability and support operations and comprise the following types: movement, stationing, regrouping, replacement, advancement, combat, junction of forces, retreat².

¹ Niculai-Tudorel Lehaci, *Tendințe în evoluția sistemului de comandă și control la nivelul operativ*, Editura Universității Naționale de Apărare „Carol I”; București, 2015, p. 5.

² Gl.bg.(r).dr. Petre Grecu, *Componenta genistică în acțiunile militare*, Editura Universității Naționale de Apărare „Carol I”, București 2005; p. 36.

Movement, as an intermediate operation, can be defined as an action associated with the struggle of large units (units, subunits) and force groups for moving from one district to another, entering into combat or maneuvering, while maintaining full combat capacity to accomplish a mission.

Depending on the circumstances and conditions in which the displacement is carried out, its purpose, the time affected, the state of communications and the existence of means of transport, the large units and the units of the ground forces are moving using the following displacement procedures: march (on wheels or on foot); transport (by road, rail, ship or air); combined (by march and transportation). Large units usually use the combined movement.

Stationing is a military activity, a state in which a unit can be found before any combat or stability and support operations. This state can also be extended during longer stops to ensure the rest of the forces that have made long-distance marches³.

Stationing is carried out to ensure the necessary conditions for the forces to prepare for a new mission, to restore their combat power and to prepare them for starting or restarting the march. It is vital that at the end of this operation, on the basis of the conditions created within it, the forces be rebuilt from the point of view of the combat power and prepared to start the march or resume it, in order to fulfill a new mission. Stationing involves a certain layout of forces to meet security demands and the ability to quickly enter the battle if the situation requires it. The stationary formation consists of: the research elements, the safety elements, the main forces, the driving system, the logistics system.

Regrouping is the action by which a new cluster of forces and capabilities is created to move on to another form of struggle, to restructure the formation, to move effort from one direction to another, to strengthen the grouping of forces from a certain direction, to move forces and means in order to remove them from the enemy's blows, changing the layout area.

The commander manages assets to gain a positional advantage by changing the location or action to create a new formation appropriate to the situation at that time.

Regrouping can be done by moving or maneuvering, engaging or disengaging assets, with or without phase lines, in a sector or operating area. Along with the three regrouping processes with a longer history, namely: from the depth to the front, along the front and from the front to the back, the "combined" one was included too, that is, that grouping involving the use of at least two of the above three processes⁴.

Replacement is one of the concrete aspects of applying the principles of concentration and dispersion of forces and equipment. In essence, replacement aims are to achieve an optimal density of forces and equipment and implicitly a ratio of assets at least acceptable to the important directions for achieving the purpose of the action. In this sense, the density of forces and equipment can grow in some directions, as they can be reduced to others.

Replacement is the operation by which a military structure takes over all or part of the mission of another structure. By doing so, the forces being replaced hand over the areas (sectors, phase lines, strips) occupied because of the actions that had taken place up to that time, other forces that replace them, for the more effective pursuit of combat operations.

The replacement of forces is carried out by the following procedures: replacing forces from a district with other forces in the positions they hold; moving forward through the disposal of the forces from the contact in order to develop offensive operation; backward through the force disposal that occupies a strip (defense, position) of defense (return to the combat device).

³ Col. prof. univ. dr. Ion Preda, *Sprrijinul genistic în operațiile forțelor terestre*, Curs de tactica genurilor de armă – geniu, Editura Universității Naționale de Apărare „Carol I”, București 2005; p. 66.

⁴ Col. prof. univ. dr. Ion Preda, *Sprrijinul genistic al acțiunilor marilor unități tactice - Tip Brigadă*, Editura Universității Naționale de Apărare „Carol I”, București 2004; p. 76.

With the name taken from NATO publications – movement to contact – moving to contact is an offensive intermediate operation designed to develop the situation with the aim of achieving or restoring contact with the enemy under the most favorable conditions for the main forces. It is always executed for the next operation and is completed when the main forces are arranged in accordance with the commander's plan.

Unlike face to face battle, where contact with the enemy is provided or not, and the goal of the operation is to destroy or force back the enemy, the advancement to the contact is aimed at achieving contact. Also, the encounter fight can take place during the advance to contact and can lead to a hasty offensive⁵.

The meeting engagement was first treated in European army regulations at the end of the eighteenth century, and may occur when two opposing forces intersect unexpectedly or may occur when the actions information gathering and exploitation, troop recognition and safety were not effective. When they meet, each opponent tries to accomplish their mission by offensive action.

The meeting engagement is characterized by the fact that it takes place in a limited space without sufficient information about the enemy, and therefore will often have an unexpected character of surprise for both opponents or at least for one of them, which leads to the development of spontaneous combat actions, which are later transformed into lasting engagement.

The junction of forces as an intermediary phase during an offensive or defensive operation consists in establishing contact between two or more of its own or allied units having the same mission or missions.

The junction of forces is usually a type of offensive operation, and the size and composition of force is determined by both the concrete conditions of the junction and those of the mission to be fulfilled. At the same time, the junction can be made, depending on the form of battle taken, both in the depth of its own formation and in the depth of the enemy formation.

The current Romanian military art regards "withdrawal" as a form of military action, which is characterized by the fact that it is carried out under the pressure of the enemy and implies the direct fight with it⁶. Withdrawal occurs when a force breaks away from the enemy as a result of the commander's decision. This involves breaking the contact with the enemy, which does not mean that the reconnaissance and / or the security elements do not continue to supervise the enemy.

As a result of the above, we can define mobility as the range of actions that contribute to the realization of the freedom of maneuver and movement in the tactical field, the winning and maintaining of initiative by the own forces, diminishing or eliminating the delay effects due to obstacles in the field (natural, artificial, dams, built by their own or enemy forces).

Engineer forces contribute to ensuring mobility by performing the following missions: engineer reconnaissance of the enemy and the terrain; ensuring the viability of communication channels; putting up and servicing obstacle crossings means; execution of gaps/holes through explosive dams; mine clearance; performing destruction to achieve mobility; aviation support through the construction, repair and maintenance of advanced runways and preparation of landing zones – advanced FOB bases and advanced supply/refueling points/FARP.

Engineer reconnaissance, a component part of the intel, is a major mission of engineer support, defined as a set of actions and measures taken to ensure the actions and protection of troops, aiming at procuring, ranking and capitalizing engineering information about the enemy and terrain from the battlefield area, the territorial infrastructure and the area of interest when the situation requires.

⁵ Alexiu D., *Operațiile de deplasare a trupelor*, Editura Academiei de Înalte Studii Militare, București, 1999, p. 114.

⁶ *Forțele Terestre în operațiile intermediare*, Conferința doctrinară a Forțelor Terestre, Ediția a II-a, București, 2004.

During the preparation/carrying out of the operations, the specialized engineer structures act to assure the viability of the roads necessary for the movement of the forces, to restore the destroyed parts of the road during the actions and to maintain the viability of the supply-evacuation routes during the operation⁷. The missions/tasks of the engineer consist in restoring road traffic, maintenance, repair and consolidation of roads, and when time allows it, building new parts of the road.

The execution of the emplacement and servicing of the obstacles passages consists of all the measures and works planned and executed, for their own benefit, by specialized forces in order to ensure the passage of the equipment and the personnel over the obstacles. Passages are those permanent works built in time of peace (permanent bridges, viaducts, etc.) or built up in the campaign, arranged for the purposes and for the needs imposed by the military actions.

Execution of the corridors through its own anti-landing dams and enemy dams is a complex task, difficult to achieve in the conditions of the modern battlefield, the main aim being to achieve the continuity of mobility in contact and in the depth of defense of the opponent by ensuring the conditions of organized passage, in time, without any loss of combat units and combat support from the engaged group through the enemy mine dams made by the enemy, the contact and the full depth of the defense device.

Mining and mine clearance are performed for the purpose of discovering, identifying, marking and, if necessary, removing hazardous areas that involve the existence of explosive barrages. Explosive engineer dams, especially mine bumps, are required to be investigated by specialized engineers (pioneers) and, when they obviously obstruct the actions of the forces and can not provide the necessary mobility, they must be demined. The portions of land that cannot be demined due to the lack of specialized engineer forces and which do not decisively influence the realization of the formation for offensive, are fenced and marked with special signs, and their demining will usually take place after the completion of the military actions.

In the following lines, I will deal with some aspects regarding engineer support in intermediate operations.

The engineer specialized forces support the stationing of other forces through the execution of the general landscaping work of the stationary districts, which may include: engineer recce, demining and mine clearance, road development and repair, leveling of parking platforms and temporary camping of troops, protective and masking works, water and electricity supply. Depending on the situation, the forces may be stationed in: mobilization districts, concentration districts, dispensing districts, reunion districts, embarkation districts, areas for day rest. The choice and occupation of a stationary station can be determined by the higher echelon or the executing echelon commander, in particular in the context of replacement, retreat or displacement operations. All activities in the station area are focused on preparing units for future operations. The commander of the large unit determines the priority of the activities being carried out and allocates the resources necessary for their accomplishment.

Engineer support during regrouping is accomplished by performing specific missions both during the movement of the unit and for the planning of the districts to be occupied by the participating forces. To support the regrouping of forces, engineer forces can perform the following engineer tasks: engineer research of regrouping itineraries and of the districts to be occupied by forces; assuring the viability of the roads necessary to carry out the regrouping; ensuring the mobility of the forces on the passageways and obstacles; planning the installation of explosive barrage to protect the forces against counter-attacks by the enemy; mine

⁷ D. Marin, *Concluzii privind sprijinul genistic pentru asigurarea mobilității trupelor proprii și realizarea contramobilității trupelor inamicului, în operațiile multinaționale, desfășurate de către structurile Forțelor Terestre*, Lucrare absolvire P.U.C., București, 2008, p. 102.

clearance and demining of regrouping districts; engineer arrangements of the stationary areas and their masking⁸.

In support of the intermediate replacement operation, the engineer forces perform missions on: achieving and maintaining the protection of the forces; taking over the existing barrage plan; opening and maintaining communication paths, including obstacles; countermobile operations; creating the lanes through the ditches.

Relief in place is done by crossing the lines forward or backward, the stationary force has the responsibility to ensure mobility for the on-going force on already prepared routes or through the lanes in its own sector. The priority of engineer support at the initial stage is to ensure mobility on the routes and lanes in the sector in support of the replacement operation. Upon completion of the replacement, the effort goes on the countermobility and survival operations for the units of the engineer forces.

As with the other intermediary operations mentioned above, the engineer support during the advance to contact has a very important role, especially in achieving the mobility of the main forces, by assuring the viability of the itineraries, the main supply routes and the ones of great importance. The mobility of the troops ensures the principles of surprise, concentration of effort and maneuver, as well as the dynamism of fighting actions with the retention of combat capabilities. When the situation permits it, the move runs on multiple columns. This allows combat forces to occupy the place quickly and increases freedom of action in any direction. Support engineers during advance to contact have an important role in opening and maintaining communication paths, using engineer techniques and supporting flanking. The maneuver subunits are arranged in the column so that they can be deployed quickly when necessary and an engineer recon element must move with the head of the column; the engineer assets can be arranged to the front of it.

The missions that engineer forces can accomplish during mobility into a close combat engagement are: ensuring mobility by creating color through enemy obstacles, developing communication paths; ensuring crossings over watercourses, valleys, etc.; specialized engineer support through the maintenance and repair of communication routes, demining and demolition activities, etc.; quickly place obstacles in front or on the flanks⁹.

The rapid deployment of the engineer forces in this situation can be essential in the transition phases of the meeting engagement. The subunit performing engineer reconnaissance must act in front of the troops. Specialized engineer forces must be prepared at all times to carry out mobility or counter-mobility tasks. The time required for the preparation, development and execution of engineer tasks is short, and therefore it is necessary to increase the reaction speed and the ability to improvise engineer forces.

The junction requires considerable effort to coordinate engineer support activities, not only with the other branches/specialties, but also between the engineer forces of the two forces involved in the operation. Because the junction's speed is the main feature contributing to its success, engineer support must pay special attention to achieving mobility of its own forces. Cleaning the movement itineraries and removing obstacles is essential for reducing the enemy's reaction and reducing the vulnerability. Engineer tasks will be assigned to the engineer support of the junction forces but also for the isolated forces.

The engineer support of the junction forces is executed for: ensuring the mobility of the junction forces by opening and maintaining the forward and junction axes; ensuring the

⁸ T.E.Stanciu, *Componenta genistică în operația de apărare desfășurată de o grupare de forțe cu rol operativ*, Teză de doctorat, București, U.N.Ap., 2006, p. 112.

⁹ D. Marin, *Concluzii privind sprijinul genistic pentru asigurarea mobilității trupelor proprii și realizarea contramobilității trupelor inamicului, în operațiile multinaționale, desfășurate de către structurile Forțelor Terestre*, Lucrare absolvire P.U.C., București, 2008, p. 98.

protection of the flank of the forward and junction axes by using the means of quickly locating obstacles.

The engineer support of the isolated forces is executed for: ensuring the mobility of the junction forces by opening and maintaining the forward and junction axes; ensuring the protection of the flank of the forward and junction axes by rapidly locating the obstacles; neutralizing or removing the obstacles in the set up area for the junction, shortly before its occurrence.

Withdrawal is a complex action that does not happen randomly, but in an organized and planned way, when the situation is compromised and the continuation of the fight is only possible with the risk of defeat. Withdrawal usually begins with contact disengagement and continuing with the movement of the forces to the fixed place. It will be executed in such a way that the offensive actions of the enemy affect it as little as possible by placing a special emphasis on reconnaissance, surprise and speed. Deceiving the enemy, making the most of the means of transport and strengthening the aviation resource, capitalizing on the means of communication, ensuring the flow of traffic, organizing and guiding movement, they are all issues to be considered when organizing the withdrawal operation.

Engineer structures, in the withdrawal operation, play a very important role in achieving mobility, being able to perform specific tasks for¹⁰: engineer reconnaissance, providing or maintaining retreat communication paths as well as for the preparation of obstacles and demolition; support for security features with vulnerability reduction missions; supporting the movement of main forces and rear echelon elements by supporting actions in the passage of unforeseen obstacles during the withdrawal (forcible actions, over obstacles); establishing detachments for the development of engineer protection; masking as far as possible the actions of the withdrawing forces in particular at choke points; using masking smoke to disengage contact with the enemy; establishing reserve routes in the situation where the main ones are contaminated; providing movement guidance service when is necessary.

Ensuring mobility in intermediate operations is a topical issue with major implications for the sizing of engineer units in the composition of land forces to be compatible and interoperable with similar structures within the armies of NATO member states.¹¹

The tasks of engineer support are defining elements, determining the success of military actions; therefore, the engineer branch brings an essential contribution to combat and general support for modern operations.

In conclusion we can state that intermediate operations are very important in and during II types of operations. They are closely related to offensive and defensive operations, but we can find them also in stability and support operations. All forces have to know how to deal with this type of operations in order to fulfill their mission. They should know that an offensive, defensive, stability or support operation can be related and used in combination with intermediate operations. All these operations combined lead the troops to successfully accomplish all the types of missions received.

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Gl.bg.(r).dr. Petre Grecu, *Componenta genistică în acțiunile militare*, Editura Universității Naționale de Apărare „Carol I”, București, 2005.

¹⁰ T.E.Stanciu, *Componenta genistică în operația de apărare desfășurată de o grupare de forțe cu rol operativ*, Teză de doctorat, București, U.N.Ap., 2006, p. 56.

¹¹ Stoykov S., *Scientific knowledge – source of a competitive advantage in security*, International conference on High Technology for Sustainable Development HiTECH 2018, Sofia, Bulgaria, 2018, p. 65.

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MOBILITY IN STABILITY OPERATIONS

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Motto: “The greater the obstacle,
the greater glory in overcoming it.”

Moliere

Abstract:

Interactions between poverty, economic inequity, the growth of population and the destruction of the environment threaten to fuel social, political, economic and other types of instability. At the same time, the spread of institutionalized democracy increasingly imposes the assertion and respect of human rights and the placement of the human being at the highest level on the scale of values. Naturally, it is necessary to adapt and reconfigure the use of their power tools to affirm the interests of states, especially the respect for human rights. That is why the military instrument has been added to - besides the traditional destination of waging and winning wars - the missions to ensure the maintenance of national and regional and global peace and stability and to deter war. The new dimensions of the use of the armed force have been named military operations of stability.

Keywords: stability; war; mobility; operations; military forces.

In the current situation of an ever-changing environment, dominated by increasingly frequent conflicts between state and non-state actors, stability operations are gaining momentum, being considered a continuation of offensive and defensive operations.

The current physiognomy of military conflicts and warfare, the demagogy of forces and the professionalization of armies, combined with the emergence of new weapon systems and the diminution of time available to make the decision, require revising and updating the existing conceptual framework¹.

Stability operations support and secure the national interest of all states by affecting the entire spectrum of operational environment dimensions over a mixture of peacetime development activities, collaborative activities and coercive measures in reaction to crises operations. The presence of army force predicts a safe society where non-committal and commercial programs can be developed to eliminate the root causes of instability. This presence can change the environment from an early shift or stable positioning in an area of operations (AO). Armed forces is capable to set and preserve a plausible presence for a long enough time to obtain the coveted results. The presence of armed forces in an area of operations often keeps the situation stable and prevents it from escalating into a war².

The main objectives of stability operations are to promote and support territorial and geographical stability. These type of operations can complete and strengthen offensive,

¹ Niculai-Tudorel Lehaçi, *Sistemul de comandă și control în contextul revoluției în afacerile militare post-război rece*, Editura Universității Naționale de Apărare „Carol I”; București, 2015, p. 6;

² Gl. lt. prof. univ. dr. Eugen Bădălan ș.a., *Tratat de tactică militară, Forțele terestre*, vol. 2, Editura Academiei Forțelor Terestre "Nicolae Bălcescu", Sibiu, 2003, p. 87.

defense and support operations. The armed forces carry out stability operations both in crisis situations, or previously, while and after offensive, defensive and support operations. In time of a crisis situation, a stability operation is able to discourage conflicts or prevent them from escalating. During unfriendly activities, these operations are able to help prevent the spread of armed conflicts and help and encourage partners in conflict. After all unfriendly activities, a stability operation may assure a safe society where civil government can act together to regain control of the region. Showing the credible capacity to perform offensive and defensive operations is the basis for the success of stability operations.

Stability operations are complex and place higher requirements at small unit level. Tactical level leaders are forced to develop their fighting skills, while maintaining combat skills. Highly skilled, qualified, disciplined and highly-prepared leaders, troupes and soldiers are particularly critical to achieving goals. Soldiers and troops at all levels must be flexible and adaptable. Stability operations often require intellectual and physical strength to be able to move from noncombat operations to fighting operations and back³.

The leadership of troops in military action has been exercised since ancient times, but the concept of command and control has been contrived and clearly defined in the last decades, with the intense research work carried out by modern armies for the broad automatization of decision-making processes and fighting techniques⁴.

The military forces carry out stability operations in particular in support of the host nation for the protection of national interests; promoting peace and discouraging aggression; performance of contractual obligations or for the implementation of internal agreements and policies; ensuring the protection of allies, governments and agencies; encouraging a failed government; maintaining or restoring order; protecting life and property; preventing, deterring and rejecting acts of terrorism; reducing the threat of weapons of mass destruction to regional security; ensuring protection against oppression, subversion, lawlessness and insurgency; promoting sustainable and receptive institutions. These operations demonstrate the army's national determination by employing time, resources, and forces to establish and strengthen diplomatic and military ties.

An important role in carrying out the stability operations alongside the fighting forces are the engineer forces, both combat and general support engineer forces. Engineer forces in support of all types of operations perform a wide range of actions that require a multitude of capabilities. Commanders use engineer troops in the full spectrum of military action. They mainly use them to ensure mobility, countermobility and to enhance the protection of their own forces.

All tasks of the engineer structures have as their primary objective the assurance of freedom of action. This freedom of action is achieved by weakening the ability of the enemy to act upon own forces. Also, engineer troops act on the ground, being involved in putting up obstacles, bridges, roads, airfields, battlefields, protection facilities, false positions, as well as a large assortment of other buildings and constructions such as military bases, ports, utilities and buildings, ensuring freedom of action. Many of these tasks fall under the categories of mobility, countermobility or force protection.

Fundamental in assuring engineer assistance to stability operations is the capacity to envisage and explore the matter and comprehend the operational context. Using as a basis this comprehension and problem analysis, planners select and apply engineering disciplines and unit capabilities to delimit personal and common tasks. They must make assumptions on how to combine specific disciplines and conduct actions in accordance with the maneuver of their own forces.

³ FM 3-07, *Stability Operations*, 6 October 2008 disponibil online la <https://www.globalsecurity.org>. Accesat la data de 07.03.2019;

⁴ Nicolai-Tudorel Lehaci, *Gestionarea crizelor din perspectiva nivelului operativ de comandă și control*, Editura Universității Naționale de Apărare „Carol I”, București, 2015, p. 8.

Ensuring the mobility of its own forces lies in the ability of engineer commanders to combine combat engineer support with the general engineer support to enable an infantry commander to use and hold a point of advantage over an enemy. This includes denying the enemy's freedom of action in an attempt to achieve his or her own advantage⁵.

When the tactical maneuver is sustained, the provision of mobility consists mainly in both mobility and countermobility tasks. Both combat engineer forces and those providing general support carry out these tasks, even though the conditions for conducting military action may require that combat engineer forces conduct such activities. When supporting operational maneuvers or force protection, ensuring mobility often involves tasks such as the construction, repair and maintenance of bridges, roads and aerodromes.

Thus, viewed as a concept, mobility represents all the actions that contribute to the realization of the freedom of maneuver, the movement in the tactical field, without delays caused by the obstacles in the field created by their own forces or by the enemy. This is necessary in order to achieve concentration of effort and for a timely and rapid deployment of forces and means aimed at engaging the enemy or breaking the fight with it⁶.

In order to keep pace with the offensive and the initiative, when meeting obstacles, the own forces perform the following activities in support of mobility: crossing over obstacles using the own means; the use of specialized forces to overcome obstacles; establishing bypassing variants when the obstacle cannot be overcome.

The main tasks of the engineer troops to support mobility in stability operations include: the passage of the valleys with or without water; minefields reconnaissance, location, marking, bypassing or execution of the lanes through them; crossing, bypassing or diminishing the dimensions of obstacles other than valleys or mined areas; performing destruction acts to ensure mobility; the rebuilding and construction of roads for the displacement of forces; support for advanced aviation through the construction, repair and maintenance of provisional tracks and preparation of landing areas⁷.

Specific engineer tasks for minefield reconnaissance, locating, marking, bypassing, or executing runways through them, as well as tasks related to crossing, bypassing or reduction of the obstacles' sizes other than valleys or mined areas are executed by combat engineer forces and more often occur when these tasks are executed at tactical level in support of the maneuver. These tasks are often considered tasks of combat engineer structures, even if general engineer support units can fulfill them when conditions allow it.

Engineer tasks for the construction, repair or maintenance of roads, bridges and aerodromes do not usually necessitate combat engineer units. To conclude, these tasks are often considered tasks of general engineer support, even if combat engineer units may accomplish them, stated the type of training they carry out. Combat engineer structures fulfill these tasks only under conditions in which they are closely supported by maneuvering forces⁸.

Contributions of the engineers to operation mobility planning take place at all stages of combat (tactical, operational and strategic) and in all four types of operations (offensive, defense, stability and support). The engineer tasks occurred in assistance of mobility often take place at the tactical and operational levels of the fight, but it will often also have implications at the strategic level. To the tactical level, these frequently require combat engineer units, especially in offensive and defense operations. At the operational level, these are usually

⁵ Gl.mr.dr.Teodor Frunzeti, *Mobilitatea forșelor - condiție importantă pentru creșterea capacității de autoprotecție și de atac a forșelor terestre*, Seminar "România - Membru al Alianței Nord-Atlantice", București, 2004, p. 117.

⁶ *Ibidem*, p. 156.

⁷ Colonel dr. Ioan Constantin, *Mobilitatea și contramobilitatea în acțiunile militare întrunite*, Editura Universității Naționale de Apărare „Carol I”, București, 2007, p. 67.

⁸ Cristian – Octavian Stanciu, *Tactica genurilor de arme [I]. Sprijinul de geniu în operațiile brigazii mecanizate*, Curs universitar, Editura Universității Naționale de Apărare „Carol I”, București, 2015, p. 54.

performed by general support engineer units. In offensive and defense operations, they focus on the mobility of their own forces. In stability and support operations, they are often focused on ensuring the mobility of the civilian population.

Tasks of engineer structures that support mobility operations as an effort line to ensure mobility can also support other effort lines. Similarly, a road built to ensure the supply of troops can also serve to support local population. Also, a bridge could be built to develop infrastructure, allowing local people to transport goods on the market. Engineer structures execute these attributions most often as a type of the combat function of mobility and maneuvers, but also fulfill those in assistance of the protection, support or other functions of the struggle. Combat engineer forces usually focus on tactical mobility, while general engineers support structures usually focus on operational mobility.

Mobility goals are paradigmatically identified as crucial tasks and can necessitate incorporation into the synchronization matrix to take into account the capabilities and time needed to implement them.

Stability operations are carried out on or outside national territory, in times of peace, crisis, war or post-conflict.

Engineer structures perform a wide range of actions to support the mobility of forces participating in stabilization operations throughout all phases of operations, from dislocation in the theater/operation area to the extraction of forces for: peacekeeping; peace enforcement; peace making; peace building; conflict prevention; evacuation of non-combatants; humanitarian and civic assistance/post-conflict reconstruction; rescue operations in case of natural calamities and disasters⁹.

Engineer support for stability operations contain the concurrent appliance of all engineering capabilities (engineer support and general engineer support) through full-field battle sync functions. General engineer assistance for the regeneration of fundamental employments and infrastructure progress is the main task of engineering structures in stability operations; however, both types of engineer tasks are simultaneously applied to a certain degree.

Stability operations are often necessary for meeting the crucial requirements of the population. Engineer forces can be a key factor in providing essential services until the host nation's authorities or other agencies can do so. Engineer tasks focus primarily on rebuilding or setting up infrastructure to provide essential services to support the population. Efforts are usually carried out in collaboration with non-governmental civilian agencies. Support for infrastructure development can be extended to help the host nation in developing its own capabilities. Essential services for engineering support, in addition to mobility tasks, include food and water, emergency shelters and sanitation (sewerage and waste disposal). Probably the engineer missions are similar to those requested in the civilian environment of their own country, except that they are performed abroad. In the framework of mobility actions, these activities include: research on the movement of force movements and provision of information on land and other geographic data after the recognition process; designing, building, restoring or consolidating military and civil roads and bridges; inspection and maintenance of built bridges; maintaining the viability of main and secondary roads; removing the debris / obstacles from the ways of transport and supply and from the rescue areas; ensuring the passage over narrow and shallow obstacles; repair and maintenance of aerodromes and preparation of helicopter landing areas in airborne evacuation operations¹⁰.

⁹ ATTP 3-34.23 (FM 5-71-100, 5-100-15, 5-116), *Engineer Operations – Echelons Above Brigade Combat Team*, 8 July 2010 disponibil online la <https://www.globalsecurity.org>, accessed on 7 March 2019.

¹⁰ Colonel dr. Ioan Constantin, *Mobilitatea și contramobilitatea în acțiunile militare întrunite*, Editura Universității Naționale de Apărare „Carol I”, București, 2007, p. 86.

Stability operations tend to have a long duration compared to other broad spectrum operations. As such, the overall level of effort of engineering structures is very increased at the beginning and progressively decreases as the action evolves, although support will be needed somewhat throughout the entire stability operation. Preparatory activities include identifying major infrastructure projects and developing the bases and nominating the respective projects for funding. Projects with the highest priority can be executed using military capabilities of general engineer support, while others can compete for emergency funding and execution through contractual capacity. As the area of operations matures, the effort of engineer structures to support requirements can be transferred to theatrical or foreign assistance contracts, as well as to other governmental or non-governmental organizations¹¹.

In stability operations, the presence of the threat may be permanent and may come from enemy forces that can use all means of fire to neutralize or destroy enemy combat forces, and also achieve the surprising effect of the attacks.

The enemy has the task of hampering peacekeeping or humanitarian assistance, discrediting participating forces and imposing freedom of movement. It can also benefit from a major network of target surveillance and control systems. An atypical enemy may have the intention of producing various damage by unconventional methods.¹²

Stability operations offer a wide range of potential tasks to any engineer commander. This may seem daunting, as it takes into account the list of key mission tasks and establishes training plans. However, the commander needs to understand these challenges and assess the priority missions to be prepared for subordinates. Planned support relationships will allow for talks with superior echelons and those units that the engineer unit might support and help the commander reduce the mission list and prioritize their preparation. There is no substitute for having a committed and disciplined unit in its core tasks. When called upon to respond to a mission, commanders can expect assistance from their subordinates to facilitate unit preparation.

In conclusion, we can say that ensuring mobility, from the engineer structures' point of view in stability operations is essential both in support of combat forces and in support of the host nation. The demining of areas, as well as the cleaning of the land of various elements and explosive devices (whether improvised explosive devices, minefields or unexploded ordnance) are also specific engineer missions that provide long-term security to local populations and their own forces. Ensuring mobility, in conjunction with countermobility missions, is essential in achieving stability missions, meaning that it provides certain security to both the civilian population and the armed forces, whether of the host or allied nation.

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¹¹ ATTP 3-34.23 (FM 5-71-100, 5-100-15, 5-116), *Engineer Operations – Echelons Above Brigade Combat Team*, 8 July 2010 available online at <https://www.globalsecurity.org>, accessed on 7 March 2019.

¹² Stoykov S., Dimitrova V., *Scientific research in the field of security – problems and solutions*, International conference on High Technology for Sustainable Development HiTECH 2018, 2018, Sofia, Bulgaria, 2018, p. 102.

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PECULIARITIES OF WARFIGHTING FUNCTIONS DURING THE OFFENSIVE OPERATION FOR THE LIBERATION OF MOSUL (17 October 2016 – 9 July 2017)

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Abstract:

The delicate problem of fighting for conquering the cities is not at all new. It has been a very important issue since antiquity. The best example could be the fight for Troy, the famous fortress. Speaking about the conflicts of the contemporary age, we must recall that the main objectives during the military operations within Afghanistan, Irak, Ukraine, Chechnya or Syria were represented by the conquering and liberation of the most important cities. During these kinds of military operations, one of the main sources of generating combat power on the battlefield was the peculiar aspects of warfighting functions, specific of any military structure, under the respective circumstances.

Keywords: *function; warfighting; offensive; operation; urban; terrain.*

Among all the operation environments, the urban area environment represents one of the most diverse physical terrain and the most complex battlefield, deeply influenced and changed by social and human activities. From an operation planning perspective, the commanders visualize the urban areas not only from topographic features point of view, but also as dynamic entities to include hostile forces, local populace and infrastructure.

To clearly understand the context, the following clarifications related to cities need to be made:

- ✓ cities are built to support life, this being maybe its most significant feature;
- ✓ cities are not natural structures, they are the result of human intervention on a natural habitat;
- ✓ cities are connected to other cities, villages, sub-urban areas, etc. influencing and being influenced by them;
- ✓ cities are not inert structures, any dysfunctionality or influence (natural disasters, violence, crime, etc.) affecting the terrain – populace - infrastructure relation;
- ✓ cities have the capacity to adapt, persisting for a long time; for example, the Russian authorities estimated after the Grozny fights (1999-2000), although all the buildings had suffered major damages and the movements were possible just during the night, at least 35000 civilians had remained there, in town.

1. MOSUL Liberation Offensive Operation – SITUATION

Situated on both banks of Tigris River, MOSUL is the second largest town in Iraq, and the capital of Nineveh Province, in the Northern side of the country. The city has on a normal basis a 2 million population, comprising different ethnic groups, the majority Arabs and Sunni Kurds. Additionally, the largest Yazidi and Christian communities live in this town.

Iraqi Security Forces (ISF), supported by international coalition – CJTF-OIF (Combined Joint Task Force – Operation Inherent Resolve), led by US Forces received the

mission to liberate Mosul which was under ISIS (ISIS – Islamic State of Iraq and Syria) occupation, a terrorist group also known as ISIL (Islamic State of Iraq and the Levant) and Daesh (the Arab name of the group). The two opponents who fought for Mosul control were ISIS forces, on one side and on the other side: ISF, Peshmerga units of Kurdish Autonomous Region (Iraqi Kurdistan), mobilized units (*PMU – Popular Mobilization Units*), which were supported by CJTF-OIR. Statistical data show that for Mosul liberation operation, code named "We Are Coming, Nineveh" 30,000 Iraqi soldiers had been mobilized.

Surprisingly, in June 2014, due to profound mistrust of Sunni populace in Iraqi government and to the retreat of many ISF from the town, ISIS, with 800-1,500 militants, succeeded in seizing Mosul just in a few days.

“With the combat losses and desertions, 60 of the Iraqi Army’s 243 combat battalions were gone, along with their equipment, which likely ended up in the hands of the Islamic State. Five of Iraq’s 14 Army divisions were rated as ineffective or had disappeared completely.”¹

In the same month, in the Big Mosque of Mosul, ISIS leader, Abu Bakr al-Baghdadi proclaimed the instauration of the self-proclaimed caliphate, which consisted in extended territories from Iraq and Syria. When ISIS took control of the city, they also gained control of important quantities of ammunition and military equipment, abandoned by ISF, which ISIS quickly used for offensive development to South, to the capital city Baghdad, pushing forward 400 kilometers. To fund their military and terrorist operations, ISIS used approximately 500 million US dollars, captured from Mosul Central Bank. Afterwards, two years of terror followed for the inhabitants of the areas controlled by the terrorist group, who publicly assassinated all the opponents of the new regime, the most terrible atrocities being committed against the Christians and Yazidi community.

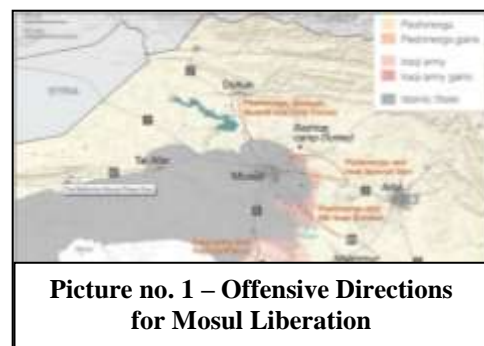
Identified as ISIS center of gravity in Iraq, the city of Mosul had remained the last urban stronghold under Jihadist group control, with a strong symbolic significance for them, some analysts stating that its liberation had meant the end of ISIS in Iraq. The settlement was the ISIS hub which provided the control of the North-Western area of Iraq, facilitating a great influx of fighters from Raka town, situated in Syria, which was the Jihadist group de facto capital.

2. “We are coming, Nineveh” Operation

Briefly, the concept of operation consisted in the attack of Kurdish-Peshmerga forces from Northern and Eastern side, ISF attack from South and PMU blocking operation in South and West. The retake the city from ISIS operation would have to be the Iraqi Security Forces responsibility in order to prevent any inter-ethnic conflict escalation.

The operation had three phases, which, sequentially targeted: the advance to city and city encirclement, Eastern Mosul liberation and Western City liberation. The most ferocious fight was here, especially because of the large number of inhabitants and urban agglomerations, with narrow and tortuous streets.

Phase one started on 17th October 2016, when Iraqi prime minister, Haider al-Abadi, publicly announced on the national television, the offensive beginning for defeating the remaining ISIS resistance in the North of the country, in city of Mosul. As you may observe on map no. 1², the troops started the movement towards Mosul from the following five



¹ David Witty, *The Iraqi Counter Terrorism Service*, Center for middle east policy, Brookings, p. 35, https://www.brookings.edu/wp-content/uploads/2016/06/David-Witty-Paper_Final_Web.pdf (04.03.2018).

² According to <https://isis.liveuamap.com/en/2017/13-january-iraqi-army-15th-division-with-pmu-fighters-surround> (13.04.2018).

main directions: from North 16th Iraqi Division and Peshmerga forces moved South securing the cities in their direction; from East the Iraqi Counter-terrorism Division and Peshmerga Forces neutralized ISIS forces from Bashiqa, Bartela and other small cities; from South, 9th Mechanized Division advanced on Highway 80; and from South-West the federal police, Iraqi 15th Division and PMU units.

Initially, the town was encircled from the Northern, Eastern, Southern and South-Western sides; on the Western side ISIS kept under control the lines of communications, which they used for receiving the support from Syrian town Raka, until 23rd November when PMU and 15th Infantry Division successfully blocked the main logistic supply routes of the Jihadi fighters, who used for resupplying a few mountain routes. On 12th March, a US envoy said that “Iraqi troops have cut all roads into Western Mosul, trapping remaining Daesh fighters inside³”.

On 1st November, CTS (Counter Terrorism Service) Special Forces entered for the first time in the peripheral districts of Mosul, marking the beginning of the urban fight for Eastern city liberation operation. During this phase, the actions aimed successively to take control of ISIS key objectives, which later became bases for subsequent actions. Among the key objectives with critical importance for the enemy, there was the local television building, a drone manufacturing facility and the Mosul University. Following the next weeks, the fights continued and ISF managed to completely liberate the Eastern Mosul on 23rd January 2017.

After a three-week break, on 19th February, Iraqi Forces, supported by CJTF-OIR with air assets, started the offensive in the Western part of Mosul, although all five bridges over Tigris River had been destroyed, meeting an enemy who fought with ferocity without any option. The operations of the third phase represented a challenging fight for any force. The Old Mosul was a different landscape, with narrow streets, where the fighting vehicles did not have access. The option for a dismounted offensive action needed to be seriously considered.

Besides CTS units, which had suffered a 40-50% losses during the Battle of Mosul, in the Western part also 9th Mechanized Division and 16th Infantry Division fought with an important role in the liberation of the city.

3. Warfighting Functions Integration during Mosul Liberation Offensive Operation

From *mission command* warfighting function perspective, one of the first challenges for the operation commander, lieutenant general Abd’ al-Amir Yarallah, was the coordination of forces, which had come from different components. Peshmerga Forces were subordinated to the government of Kurdish Autonomous Region, CTS were directly under prime minister’s command, and PMU were also under prime minister’s command but strongly influenced by Iran, through Iranian advisors. Further, Iraqi Federal Police was subordinated to the minister of interior, and Emergency Response Division was directly under prime minister’s command. Finally, 9th Mechanized, 15th and 16th Infantry Divisions of ISF were under the minister of defense’s command.

One may observe a mix of units which never fought together, therefore being quite surprising that it functioned well. Most likely the action had in common the desire to free all the areas occupied by ISIS. Once each of the unit’s roles had been negotiated and established, the units planned and conducted their actions independently. We consider that this explains the disjointed efforts observed in phase two of the confrontation, when CTS brigades fought alone to secure Eastern Mosul. The other units who were supposed to attack from other directions, stayed outside the city, allowing ISIS to concentrate all their strength on CTS, provoking large losses. The lesson was not learned, therefore, in the first months of fighting for Western Mosul, the main actors were the same CTS soldiers along with Federal Police and

³ <https://gulfnews.com/news/mena/iraq/timeline-the-battle-for-mosul-1.2045400>, (10.02.2018).

Emergency Response Division, who did not actually manage to hold the cleared areas, ISIS counterattacks continuing to be very virulent. *“When Iraqi forces attacked on multiple axes with all forces involved, they were successful, but not otherwise.”*⁴

CJTF-OIR advisors, who had been supporting ISF tactical level commanders, had a very important role in the operation progress. One of the solutions for operation command and support was the utilization of satellite connections and aerial assets provided by CJTF-OIR. We can mention that CTS forces used command and control software, installed on portable devices like tablets, which were used by tactical elements commanders.

The key of success for Mosul liberation operation consisted in providing timely and efficient *intelligence* support. The collected information from all sensors’ integration, to include HUMINT collection, enabled the analysts to accurately identify the targets and to timely provide the required information and intelligence for the targeting process. However, although there had been accurate information about the targets, there were also civil casualties after the engagements.

*“So many people in Mosul wanted to cooperate with us because they wanted revenge [against] ISIS for killing their family members”.*⁵ For others, collection and dissemination of information about ISIS represented their way to fight. There was also the third category of people, who were paid to provide information, the amount of money depending on the importance and accuracy of the information. Last but not least, among the people who cooperated with ISF HUMINT elements there were ISIS followers whose expectations had been severely disappointed by the terrorist groups because of the cruel practices they had adopted. The last group of HUMINT sources offered data and information about the activities planned by Jihadi group, in order to dissociate from it, knowing that their actions went in the wrong direction, a totally different one than what it had been presented to them initially. The stake was very important for these human sources, namely their life. The disclosed or suspected individuals had been tortured or killed, as example of treason repercussion.

As we can observe, the information sources existed, but the most sensitive issue was the data and information transfer to ISF. ISIS exercised total control over the remaining captive inhabitants from Mosul city and in multiple situations the sources transmitted the information through internet or text messages, using their mobile phones, this method proving to be the most utilized, even though ISIS had forbidden mobile phone utilization in Mosul. Direct engagements with HUMINT teams were rarely conducted.

The coalition aerial assets had a crucial role in pursuing valuable intelligence in order to permit the offensive development for ISF. *“The skies of the city are now packed, full of U.S. and coalition strike aircraft, surveillance drones, and refueling platforms”*⁶, providing the Iraqi forces with the possibility to advance, to target ISIS leaders and to discover the enemy composition, disposition and strength in defense.

From *maneuver* perspective, it must be emphasized that in Battle of Mosul, battalion/brigade level tactical units were unable to take action. Combat elements of infantry squad, platoon, or maximum company level were predominantly utilized due to the rolling terrain of the city.

It is very interesting to observe that *“an Armed ISR platform, Tank, Bulldozer, Anti-Tank Missile, Sniper, and Rifle Squad operating as a micro team, provides the organic abilities to Identify, Neutralize, Suppress, Obscure, Secure, Reduce and Assault (SOSRA) in a*

⁴ Col. (ret.) David M. Witty, *Reviewing the battle of Mosul*, interviewed on 10.07.2017, <http://musingsoniraq.blogspot.ro/2017/07/reviewing-battle-of-mosul-interview.html>, (23.03.2018);

⁵ Vera Mironova, Ekaterina Sergatskova, Karam Alhamad, *ISIS' intelligence service refuses to die*, <https://www.foreignaffairs.com/articles/iraq/2017-11-22/isis-intelligence-service-refuses-die> (12.04.2018).

⁶ <http://foreignpolicy.com/2016/10/17/mosul-is-going-to-embrace-the-united-states-as-liberators-isis-islamic-state-iraq> (15.04.2018).

complex urban environment”⁷. Each combat element was advised by a CJTF-OIR team, who was also responsible for fire and air support coordination. “*In January 2017, the 82nd Airborne’s 2nd Brigade Combat Team deployed upwards of 1,700 paratroopers to the Mosul Theater. Numerous coalition special operations units also worked closely at or near the frontlines, at times directly assisting Iraqi counterparts*”⁸.

The main forms of maneuver adopted by the attacking forces were penetration, envelopment and frontal attack – preceded by airstrikes. The planned and achieved goal of the penetration was to seize decisive objectives, which allowed the exploitation of success through envelopment maneuvers. In order to seize buildings with enemy fortified defensive positions, the frontal attack was used but only after artillery, tanks and aerial fires preparation. After military experts had analyzed the operation, they concluded that the Iraqi Forces were very efficient just when they had simultaneously attacked from multiple directions, preventing the enemy to concentrate their defensive effort in a certain area.

In the Western side of the city, where the streets were hardly accessible or inaccessible, ISF were forced to fight without vehicle weapons system support. Conversely, the maneuver was supported by air and artillery fires, which, in specific situations, caused a large toll of civil casualties due to the increased number of civilians who had remained in the city.

It must be highlighted that once fights continued and close air and fire support were widely utilized, the maneuver of forces and systems was slowed by the building wreckage, the bombing of the ground lines of communication and the persistent smoke and dust clouds.

Fires warfighting function was widely exercised during the operation, in order to set the condition for the offensive development. On one side, fire support was provided by CJTF-OIR, using smart ammunitions, GPS-guided, and on the other side, by ISF incorporated units, which were accused of using indiscriminately fires, causing many collateral victims.

The main factors contributing to Mosul operation fire support were US and French armed forces. US Army deployed in vicinity of Mosul two artillery platoons equipped with HIMARS Systems, 155 mm caliber self-propelled howitzers, M-777 type, on Paladin chassis or towed. At the same time, with the same high efficiency, French artillery units provided fire support with five CESAR self-propelled artillery systems.

We must agree that the most important role for offensive support was assigned to airstrikes. Thousands of airstrikes weakened ISIS defense, both during the operation preparation phase and its progress. “US pilots say the airspace above western Mosul is thick with aircraft. At any given time, up to 50 warplanes are flying in an increasingly compressed area” and many of them were UAS (Unmanned Aerial Systems).

Mobility was realized, firstly, through the clearance of air and artillery fires effects, in order to support combat elements maneuver, logistics and medical evacuation. Bulldozers had been integrated in small tactical combined groups, which removed the obstacles from Mosul streets.

Another category of missions conducted by specialized engineer units was the demolitions in support of mobility. In order to avoid possible explosive traps which ISIS fighters emplaced in the building entrances, sometimes, they used the option to create breaches in the walls of the building, facilitating the clearance of the respective location.

One of the missions was conducted to support the assault forces materialized in Tigris River crossings, at the beginning of Western Mosul operation phase, knowing that, as previously mentioned, all five permanent crossings (bridges) were destroyed. In order to consolidate the secured objectives and to prevent ISIS counterattacks, conducted with VBIEDs, ISF emplaced obstacles on the most important avenues of approach.

⁷ <https://www.army.gov.au/our-future/blog/land-combat/immediate-lessons-from-the-battle-of-mosul> (16.03.2018).

⁸ Paul B. Spiegel, *colectiv, The Mosul trauma response – a case study*, Johns Hopkins Center for Humanitarian Health, http://www.hopkinshumanitarianhealth.org/assets/documents/Mosul_Report_FINAL_Feb_14_2018.pdf, pp. 10 (15.03.2018).

From *protection* warfighting function perspective, according to some indicators, ISIS "has used chemical weapons, including chlorine and sulfur mustard agents, at least 52 times on the battlefield in Syria and Iraq since it swept to power in 2014"⁹. Peshmerga forces and PMU were especially targeted because they were not equipped with personal protective equipment. Among the utilized agents there were chlorine and sulfur mustard agents, requiring medical care for the contaminated soldiers and in some cases provoking the death of the soldiers.

Although ISIS did not possess aerial systems, ISF needed to take passive and active air defense measures in order to counter drones attack, launched by the Jihadist group. The jamming and countering drone systems like RAYSUN MD1 Multicopter Defender, detection systems, surveillance and counter UAV systems like Blighter Anti UAV Defense System (AUDS) and, last but not the least, individual weapons proved to be among the most efficient methods to counter the unmanned aerial systems.

Analyzing the *information* activities indicators, I need to once again bring up the fact that even before the beginning of Mosul operation, both ISF and ISIS, intensified their actions in this direction, which focused, mainly, on shaping public opinion perception about the fight and influencing the opponent's will to fight. The main technique used by both sides to achieve their goals was aggressive propaganda, utilizing tools as mass-media, internet and social networks, with much the same strategies.

A first effort was aimed at incapacitating the enemy will to resist, instilling the feeling of hopelessness and emphasizing the success of own forces. A second effort targeted presenting the advantages offered to local Mosul inhabitants by Iraqi forces, highlighting the negative effects of ISIS actions. The third strategy targeted the enemy propaganda credibility questioning the religious legitimacy of the messenger.

The manner in which the message did or not resonate with the expectations of the local population played a decisive role in forming perceptions and, implicitly, the association with one of the parties. Therefore, the stake of information operations was huge, as their success or failure influenced not only the operation itself but also the post-ISIS activities.

As the civilian population access to the media in the territories controlled by the Jihadist group was restricted, the coalition forces launched, through aviation, about 17 million flyers, entitled "*The Hour of Decisiveness in Mosul*", promoting the need for joint effort in eradication of the self-proclaimed caliphate. A major media impact on the population was also the Iraqi Prime Minister's television announcement of the start of the Nineveh province's liberation "(...) *our borders are the borders of Iraq,*" therefore "*We Are Coming For You Ninewa!*", "*The hour of victory has rung ... I announce today the beginning of this heroic operation to liberate you ... God willing, we will soon meet in Mosul and celebrate your freedom and salvation.*" In the same context, in an effort to win the support of the local population in the territories still controlled by the Islamic State, some flyers called "*Letters to Mosul*" were also released. In these flyers, people from the liberated territories reported the experience and how their lives changed with the end of the ISIS period. In order to discredit opponents, ISF posted messages and photographs on social networks that highlighted the fact that after raids at ISIS locations, alcoholic beverages were discovered, a contradiction to Muslim religion, therefore casting doubt on the legitimacy of the group that had as theoretically basis the caliphate instauration.

On the other hand, for the purpose of achieving its own propaganda, the terrorist group used local radio and television stations, and the internet network. In their approach, ISIS cells

⁹ <https://www.nytimes.com/2016/11/21/world/middleeast/isis-chemical-weapons-syria-iraq-mosul.html> (02.04.2018).

broadcast images of people in ISF clothes, carrying out atrocities against the local population or destroying certain public facilities, banning access to resources. Thus, the dissatisfaction of the civilian population in the conflict zone amplified, causing the coalition forces to speed up the measures of counteracting the effects of these actions. A virulent campaign to promote ISIS was initiated in the virtual environment in order to attract collaborators and recruit new followers, especially volunteers willing to commit suicide attacks.

Reality showed that the authorities had won the cause in this media war, their message reaching a large number of inhabitants, which led to the consolidation of credibility regarding the issue of regaining of the lost territories. However, due to the government's inability to ensure a safe and stable security environment, ISIS propaganda succeeded and continued to erode the image of the authorities.

Just as in any other operation, *sustainment* was crucial, a significant role being played by the CJTF-OIR support, especially from USA. We can distinguish two different phases in order to ensure logistic support, as follows: the first phase which was overall the planning period of the anti-ISIS operation, and the second phase, represented by the logistic support activities conducted during the Mosul liberation offensive operation.

We do have to mention that, because of the losses suffered in 2014, ISF had serious issues in supplying the necessary weapons, ammunition, combat equipment and other essential equipment in order to start offensive operations. This is the reason why, in addition to the advisory teams, the support of CJTF-OIR consisted also in providing an adequate level of equipment and endowment. Thereby, ISF received tanks, armored trucks, weapons and ammo, equipment, command and control systems, etc. and naturally, trainers to prepare the specialists.

In order to provide medical support, CJTF-OIR had two mobile hospitals on South and East of Mosul City, in the cities that had already been liberated. In the proximity of the conflict area, there were also different encampments belonging to various international organizations (Red Cross, International Medical Corps, Mediciens Sans Frontiers/Doctors without Borders and others) whose main role was to amplify the efforts to try and save as many human lives as possible. After they had received first aid in the operation area, casualties were evacuated in these locations, where they received specialized care. We do have to mention that, in some situations, the military medical resources were used to treat wounded civilians, in critical condition.

The resupply of the forces in contact with the necessary supplies to conduct the operation was realized, most of the times, by land and sometimes by air, especially during the night. Most of the supply requests were for petroleum, oil and lubricants (class III) and ammunition (class V).

The fighting vehicles that were damaged but still repairable were evacuated and from the ones that could not be repaired, the working parts were removed, and the vehicles were abandoned until the end of the operation. The military vehicles captured by the ISIS fighters were destroyed with airstrikes.

Although there were big challenges in accomplishing efficient logistic support, the issued support managed to adapt to the urban confrontation environment and to provide all the necessary resources for the operation.

4. Conclusions

In the end, I would like to highlight the lesson learned after the end of this operation, which will represent future references.

Firstly, one of the things which the Mosul liberation operation emphasized was the fact that the most efficient capability from the recent space battlefield was an inter-departmental (inter-ministerial), joint, combined with an armed unmanned aerial asset (Predator platforms, Hell fire ammunition Reaper – AGM 114). These platforms permit positive identification of targets of

opportunity, using the complex environment to cover their movements, creating at the same time, the possibility that the JTAC and the ground commander quickly decide the target engagement with its own capability. This is the reason why, in the future, a force without this capability will have a huge disadvantage in urban areas operations.

Another lesson learned was that the enemy widely used VBIEDs (Vehicle Born Improvised Explosive Devices) directed/guided towards targets with drones. Unlike rockets, these “weapons” can be launched from any building in which a vehicle could fit, which means almost any building. On its path to the target, the VBIED, through an operator command from an operation center, can stop, turn or steer, launch more fighters and then accelerate with over 100 km/h and hit an area where own forces are massed or other high value targets. The image captured by the drone could be instantaneously uploaded on the virtual space and used as a propaganda tool. All direction security, flanks protection and quick transition from an offensive action to defense, combined with quickly laid out obstacles proved to be the most efficient methods to counter this kind of threat.

ISIS used the internet to spread fear and to recruit new acolytes for their cause. Information technology allowed them to record messages and to disseminate them to both local populace and global audience, in a short time. The counteraction required the authority and the capability to take control over the message and to provide the information supremacy of the own forces.

Any movement in the urban area required an obstacle bypass. Mosul liberation operation showed that applied tactics, techniques and procedures by ISF were efficient. For example, Khodar river-crossing determined ISIS defense disruption which contributed to the penetration of the defense in central part of Eastern Mosul.

Combat fighting principles and old axioms, which may be applied on the battlefield, are still valid during the offensive action in contemporary urban areas, using new technologies and making only small changes. Among them we may enumerate discipline, all direction security/flanks protection, quick transition from an offensive action to defense and again to attack, operation security (OPSEC), pattern avoidance, surprise, information collection and fire support to the main effort, joint elements utilization, sustainment, commanders advance close enough to the frontline in order to influence the operation, medical support, maintaining the tempo through a refit period planning (rest and resupply), quick execution of the repairs and effective equipment maintenance.

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THE TYPOLOGY OF MODERN CONFLICTS

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Abstract:

Competition between rival groups or nations, using all the instruments of power (political, military, economic and civil) has always characterized the international environment. Throughout history, the majority of disputes have been solved peacefully (through the use of politics/diplomacy, economy or the civilian environment), and the use of the military instrument has been mostly static, in order to deter the potential opponents. The use of military force intervened only when the other instruments of the state power were exhausted or proved to be ineffective in reaching acceptable conditions for solving conflicts. Claus von Clausewitz described the use of military power as "an act of violence to force the enemy to accept our conditions, "a statement that proved valid until after World War II. The values of contemporary society condemn such a vision, although the geopolitical environment has become more complex and the nature of the threats is more varied. Paradoxically, Sun Tzu thinking is still in use, noting that "although the battles must be won, getting 100 wins out of 100 battles is not the pinnacle of skill. Defeating the enemy without engaging in the fight is considered to be the culmination of military art. "

Keywords: war; conventional; unconventional; asymmetrical; irregular.

In this article I intend to present the defining aspects of the typology of contemporary wars and to highlight the main differences between them. We considered this exposure necessary in order to emphasize the spectrum of expression and the particularities of each form of conflict for the purpose of identifying the specific environment in which they take place in relation to the typology of conventional, unconventional and asymmetric wars. Thus, the first generation of war experienced a very long process of evolution, in line with the development of Western European societies. The characteristic aspect was the large number of armies involved in the wars, reaching a peak in Napoleon Bonaparte's time. The second generation of war followed, which was dominated by firepower in general, reaching the climax during the First World War. The Third Generation of War was introduced by the Germans during the Second World War, having as an essential feature the maneuver of forces and means vertically and horizontally. The US military also "contributed" to the emergence of this generation of war by developing and using the nuclear weapon, which generated the surrender of Japan and the end of the Second World War in the Pacific. Therefore, it is important to note that the three generations of war have not been characterized by a rapid transformation from one phase to the other, but have evolved over time, being predictable through developments and social changes throughout history. Moreover, it can be added that the three generations of war had a logical progression: the first generation of war was concentrated on the destruction of human force as a constituent part of the army, the second generation was based on fire power, but also on means of destroying the enemy's combat force, while the third generation of war, supported by air force, aimed at eliminating command and control capabilities, as well as logistic support as the most effective way to defeat the enemy.

It can be said that the nature of conflicts, throughout history, had an evolutionary character and not a revolutionary one. The evolution of mankind from an industrial to an information technology-based society has decisively influenced the way of conducting and managing

conflicts. The conventional war (the first three generations of war) was successfully replaced by the unconventional and asymmetric one, introduced and developed by states or organizations that are much weaker in military, economic and administrative-political terms than their technically well-equipped opponents with a reasonable logistical support. The fact that only these types of conflicts (unconventional and asymmetric – the fourth generation of war) have been successful against armies of developed countries is a key element in investigating the evolution of warfare. If not long ago, winning a war meant winning the fight with the enemy from a military point of view in the asymmetric and unconventional conflicts the geometry of success implied the engagement of other levels to the detriment of the military.

1. Conventional war

The dictionary of crisis-specific terms defines conventional (classic) war as a "war type in which no weapons of mass destruction are used, but only the means of classical battle. The battle is carried out only by regular armed forces, thus distinguishing among the wars carried out by irregular armed forces (militias, guerrillas, partisans, etc.)"¹. Thereby, it can be observed that the essential aspects of this concept are captured in three basic ideas: the use of classical combat means, the non-use of weapons of mass destruction and the exclusive presence of regular armed forces, this being the defining feature of such a war².

A similar definition to the above is provided by Alex Roland: "Conventional war is the armed conflict between two or more states using modern non-nuclear weapons for direct battle between organized military forces. Nuclear weapons can be developed, threats may be referred to, but not yet used"³. Roland's definition has the peculiarity that it comes with a supplement that highlights the limit to which a conventional war turns into a nuclear one.

From the outcomes of studies, it follows that there is a universal understanding of this concept. Most authors give the concept of conventional warfare a basic feature: armed battle between regular forces of two or more states without the use of nuclear weapons⁴.

If Roland has added value to the definition of conventional war by specifying the limit to which it is transformed into a nuclear war, there is no clear distinction in the studied bibliography, a limit to which a war is considered conventional, or an unconventional one⁵. Nor is there, we can say, a very clear separation between the two types of wars, since in their development both can contain nuances from the other's features. For example, even though the Second World War had the general character of conventional warfare, it also contained some active irregular armed formations of partisans (Soviet and Yugoslav) who carried out unconventional fighting actions.

A comprehensive description of the concept of conventional warfare is found in a document issued in 2007 by the US Department of Defense. The document presents conventional or "traditional" warfare as a form of warfare between states engaging direct military confrontation to defeat adverse armed forces, destroy enemy war production capabilities, capture or retain territory under control to force a change in the policy of the adverse government. Conventional military operations are focused on the adverse armed forces with the goal of influencing the adverse government. This implies that the indigenous population of the operation area is non-belligerent and will accept any political outcome that belligerent governments impose, arbitrarily or through negotiations. A fundamental military

¹ Mircea Cosma, Benone Sfârlog, Alexandru Rizescu, *Dicționarul de termeni specifici crizelor*, p. 40, available online at: <https://www.uploady.com/#!/download/W4vFtzCMW4z/vMJxz5YiSHmdztDK>, accessed at 14.01.2015.

² Col. Liviu Ioniță, *Fizionomia conflictelor contemporane. Ascensiunea abordărilor neliniare*, p. 14.

³ Alex Roland, *The Transformation of Conventional War*, article published on Website "American Diplomacy", Available online at: http://www.unc.edu/depts/diplomat/AD_Issues/amdipl_4/roland2.html, accessed at 13.01.2015.

⁴ Col. Liviu Ioniță, *op.cit.*, p. 15.

⁵ *Ibidem*.

objective in conventional military operations is to minimize the interference of the civilian population in these operations"⁶.

Consequently, conventional military operations are concentrated on defeating the enemy's armed forces with the aim of influencing the political environment. It is also assumed that the civilian population has the status of non-belligerents, and as a result of this status will accept the political effects imposed, arbitrated or negotiated by the belligerent states. The fundamental military objective in conventional operations is to limit the exposure of civilian population to military action and thus minimize the production of collateral victims.

2. Unconventional war

Regarding unconventional warfare, the concept has multiple meanings within the different security and defense communities. In American specialist literature, the perception of the concept of unconventional war evolved over certain historical periods. During the Second World War, the terms in which the unconventional war was defined related to the guerrilla warfare and undercover operations in the enemy territory. Immediately after the war, in the 1950s, the US military resembled unconventional warfare with partisan battles. Then, in 1955, unconventional warfare was described in US military textbooks as a combination of three factors: guerrilla warfare, escape, evasion, and subversion against hostile states.⁷

According to the US Special Forces force doctrine, conventional war is defined as: "Operations driven by, with or through irregular forces in support of a resistance, insurgency, or for the benefit of conventional military operation"⁸.

The definition reflects two essential criteria for distinguishing unconventional war from other types of conflict:

- the unconventional conflict is carried out "by, with or through irregular forces" and must be executed in support of an insurgency movement (ex. the support provided by the US Special Forces for Contras guerrilla forces in the 1980s for the removal of the Communist government Sandinista in Nicaragua), or a resistance movement to defeat an occupation force (US support for the Afghan mujahidin in the 1980s during the Soviet invasion), or to support conventional military operations (US special forces action to prepare for invasions in Afghanistan and Iraq);

- the fact that it is executed "by, with or through irregular forces" distinguishes this type of conflict from other combat procedures, such as: direct military actions (attack, raid or incursion), reconnaissance into the enemy's formations or counter terrorism missions.

The term "irregular forces" refers to individuals or groups of individuals who are not members of regular armed forces, police, or any other type of security organization. As a rule, these types of groupings are non-state actors and do not fall under the sovereignty or geographical limitations of a sovereign state. Irregular forces include: paramilitary forces, contractors / mercenaries, political or military-political organizations, resistance or insurgency movements, foreign citizens, members of terrorist organizations or other socially or politically undesirable categories (enumeration is not exhaustive).

In view of the above, I consider that unconventional war is not a term to define everything that does not belong to the conventional, regular or traditional conflict, nor is it synonymous with the terms "irregular war" or "asymmetric war". Moreover, unconventional war is neither similar to special operations nor to guerrilla warfare. Special operations include

⁶ Irregular Warfare (IW) Joint Operating Concept (JOC), *Department of Defence, United States of America*, 2007, version 1.0, available online at: http://www.dtic.mil/doctrine/concepts/joint_concepts/joc_iw_v1.pdf, accessed at 12.09.2016.

⁷ Army Special Operations Forces Unconventional Warfare, FM 3-05.130, *Headquarters, Department of the Army*, 2008, available online at: <https://www.fas.org/irp/doddir/army/fm3-05-130.pdf>, accessed at 12.01.2015.

⁸ *Ibidem*, p. 7.

unconventional war-specific operations and not vice versa, and guerrilla warfare, although it is a classical inherent component of unconventional warfare, is considered to be only a technique of this type of conflict, while conventional warfare itself represents a way of conducting an operation / campaign.

This last definition of unconventional warfare also represents the current view of American experts in the field on how this type of war manifests itself in the contemporary world. It can be noticed that the definition has constantly adapted to the realities of the various stages of conflict evolution and has included issues that have been major concerns at a given time (partisan battles, guerrilla warfare, subversion, clandestine and / or covered actions, resistance movement and insurgency movement)⁹.

3. Asymmetric (irregular) war

The Doctrine of the US Special Forces defines asymmetric war as "a violent conflict between state and non-state actors for the preservation/acquisition of legitimacy and influence over the population"¹⁰. The asymmetric war favors indirect and irregular approaches of both sides of the conflict, although a wide variety of military forces and conventional operations can be employed in order to erode the power, influence, and determination to fight of the opponent.

The events of September 11, 2001 changed the US, the attitudes of the Americans, and the world we live in. We live in a world where boundaries change from day to day, where social dynamics outweigh any expectations. It was the moment when it was realized that military doctrines could no longer rely solely on a conventional, regular or traditional approach to conflicts and found the imperative need to adapt to new types of threats.

The recent armed conflicts have shown that the era of the mass army has come to an end, being replaced by the professional army with high mobility and power, able to intervene in a short time in any area of operations, regardless of the coordinates on the globe.

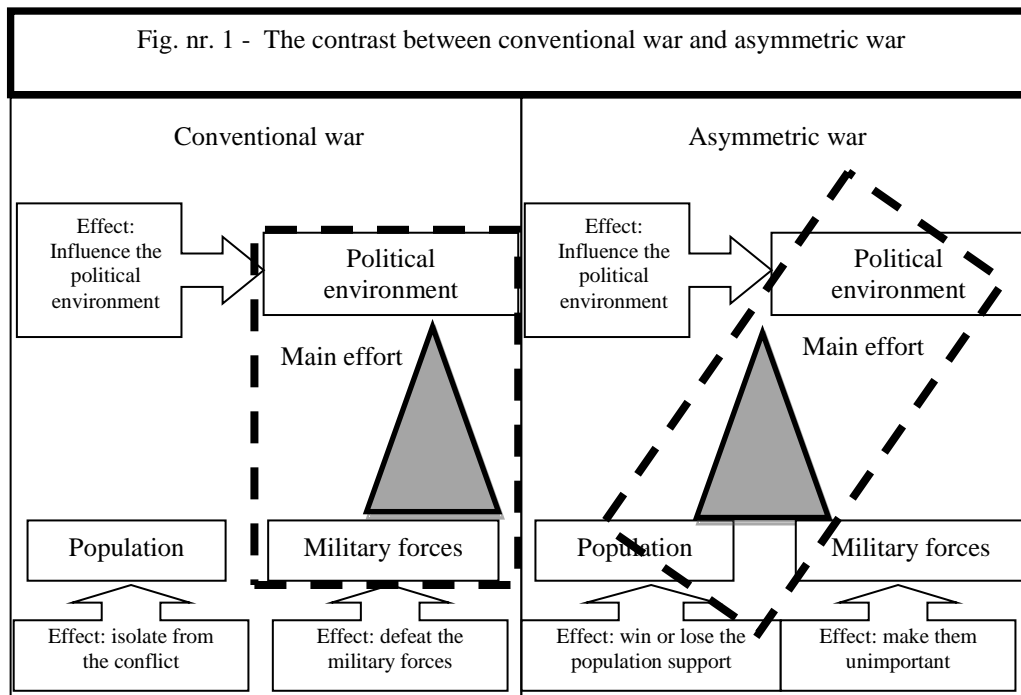
The main causes of current and future military conflicts include: the existing incompatibility between dictatorial or autocratic and democratic political systems; the immense gap between the rich and the poor world, between high-tech-IT civilization and traditional, diversified civilizations, on different stages of development, with traditions, habits and ancestral values; dissymmetry and asymmetry manifested through the extreme violence of terrorist attacks; the predominance of alliance and coalition strategies; the omnipresence of the action-reaction binomial.

The essential feature of asymmetric warfare in winning a conflict is based on the essential theory of insurgency movements and consists of using all possible networks - political, economic, social and military domains - to persuade the opponent policy makers that their strategic goals are either untouchable or too expensive to achieve. The basis of this foundation is given by the "superior political will" of the insurgents, which, when appropriately engaged and exploited, can overcome military and economic stronger states. Unlike previous generations of war, the asymmetric conflict does not mean overcoming the enemy's military force, but by using networks in the political, economic, social and military fields, it directly attacks the decision-maker's subconscious with the purpose of the destroying the political will of the state in cause of continuing to be engaged in a conflict. So it can be said that the asymmetric war does not focus on military technology and hi-tech equipment from which combat forces would benefit too but simply to gain the support of the population in the sense of influencing it to accept the conditions of one of the belligerents as legitimate. In both types of war, the desired effect is the influence of the political environment; what contrasts them, however, is the level on which each type of conflict focuses on achieving the

⁹ Col. Liviu Ioniță, *op.cit.*, p. 18.

¹⁰ *Ibidem*, p. 7.

objectives. Thus, as shown in Figure no. 1, the conventional war aims at defeating the enemy's military forces, while the asymmetric war seeks to gain the support of the population.



Another crucial issue in understanding this type of conflict is underlined by its length, measured in decades rather than in months or years, as is the case of the conventional conflict.

So I think the most effective "offensive" in the asymmetric war is to win what insurgents cannot afford to lose – control over the population. Offensive actions do not necessarily mean large-scale military operations, but rather the gaining of trust and support of the population, on the background of rejecting insurgents' influence within these communities. Regular cooperation with local population leaders and their involvement in local and regional development projects is another example of offensive, which contributes to increasing the population's confidence and, at the same time, to increasing the level of security and improving the standard of living. It is the civil society that will decide the fate of the asymmetric war, depending on who will provide protection, lifestyle, respect, and viable opportunities for the future.

As I mentioned before, the essential distinction between the asymmetric threat and the one depicted by conventional military power lies in the fact that the former seeks to discredit the government of the state in which it acts and provoke a military response in force from it that would have disastrous effects on the population. Military conflict itself is the secondary target of insurgents, while the main mission focuses on political, economic and social areas, aiming at gaining public confidence and adhering to their cause. In order to be able to achieve this goal, insurgents adapt their actions to local conditions and carry out real information campaigns to influence and manipulate the masses.

For example, in Afghanistan, the most commonly used method in this regard was expressed in image campaigns led by the Taliban forces, by which they declared themselves the only ones able to preserve and perpetuate Afghan traditions and Muslim religion.

Responding to these threats in a conventional way, through predictable actions, one can compare to a corundum show, in which the bull fiercely faces (predictably, in fact), the matador's cape to exhaustion, when defeated by him, actually a much weaker opponent.

Another defining issue in highlighting the differences between conventional and asymmetric conflicts is marked by the changes that occur in the states involved, after the hostilities between the belligerent sides had come to an end. Recent history shows that most of the conventional conflicts that followed the Second World War (the Korean War, the 1956,

1967 and 1973 Arab-Israeli wars, the war in the Falkland Islands, the war between Iran and Iraq, the first Gulf War, etc.) did not bring major political, social and economic changes to those involved in the conflict. There were situations in which some territorial adjustments or changed political regimes took place, but essentially the situation and strategic interests of the participants in these conflicts have not changed significantly.

Conversely, the asymmetric conflict, through its contemporary manifestations of form (the Chinese Communist Revolution, Indochina's First and Second War, the Algerian War of Independence, the Sandinist Revolution in Nicaragua, the Iranian Revolution, the 1980s Russian-Afghan War, the First Intifada and the Russo-Chechen War) reveal completely different patterns from conventional war. Each of these conflicts has brought major political, economic and social changes to the territories involved, even if in some cases they have proven to be strategic disadvantages for the states concerned (Nicaragua, Iran). Moreover, asymmetric conflicts have led to major changes even in cases where insurgents have lost, issues encountered in the case of the conflicts in Malaysia, Oman or El Salvador. So, as we analyze the evolution of the nature of the conflicts towards the fourth generation of war (the asymmetric conflict), we recall two essential features specific to the latter:

- it has a long duration, which spans decades, unlike conventional wars, which in most cases are measured in months or several years. It is worth mentioning here that the Chinese Communist revolutionaries fought for 27 years to succeed in establishing Communism in China, the Vietnamese needed 30 years to defeat the French and American troops, and the Afghans struggled for 10 years to get rid of the Soviet occupation;

- it is the only type of conflict through which a super power was defeated. The evidence of this statement can easily be found in recent history, in the light of the fact that both the US and the Soviet Union (and later Russia) were defeated, and not just once, by practicing this form of war.

Finally, analyzing the three types of war presented, it can be concluded that the conventional war is centered on military confrontations between state actors, where the desired effect is to influence the opponents' political environment by overcoming their military capability. In addition, the belligerent parties are trying not to expose the civilian population to military confrontations and thus reduce collateral damage.

At the same time, the remarkable difference between unconventional and asymmetric war is that the first type of conflict is a component and a method of the latter, although both types of conflict are centered on influencing the population. The distinctive feature is that in the case of asymmetric war it is not necessary to use irregular forces, while unconventional war is driven by, with and for irregular forces. Unconventional war can be the central effort in an asymmetric campaign in which conventional military forces are not used or can be driven as an element of asymmetric warfare in support of conventional military operations.

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STUDY ON SELF-FINANCING POTENTIAL IN THE NATIONAL DEFENSE INSTITUTION

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Abstract:

Expenditure on national defense quantifies the strategic component that is the guarantee of national sovereignty and security, which implicitly requires the allocation of important financial resources. Self-financed activities in the national defense sector come to complete the picture of the financing of public institutions' expenditure on their own income. Income revenue activities are in close connection with the field, profile and type of public institution. Our study aims to investigate the specific links existing in the financing of the defense sector between the total budgets and the assigned revenues of the defense institution in relation to the gross domestic product (GDP) and the public debt of Romania. The proposed research methods are the analysis of the main component (PCA) and later the multiple linear regression. Following the analysis of the results obtained from the testing carried out on the basis of the two models, it is noticed that in the national defense sector there is an experience of using the financial resources obtained from own revenues achieved by carrying out a relatively small number of source activities.

Keywords: *self-financing; budgets; own income; GDP; public debt.*

Introduction

Nowadays, political alliances, economic and especially military ones, through the spheres and zones of influence that distinguish them, they redefine the foundations for the development of states and even regions around the world.

Having this in mind, national defense expenditures are among the major expenditure categories that are part of the public budget for which the state mobilizes significant resources in order to fulfill its external and strategic function of assuring national security (Vacarel, 2008). Thereby, expenditure on national defense quantifies the strategic component that is the guarantee of national sovereignty and security, which implicitly requires the allocation of important financial resources.

If we consider the source of funding for national defense spending, according to Ene (2015) the internal funding of the defense institution is based on the budgetary appropriations hierarchically available on the budget financing system and on own revenues made and used in the fields for which the institution has competence.

Although they are not financial consistent, self-financed activities in the national defense sector come to complete the financing of expenditure in public institutions based on their own income. Income revenue activities are in close connection with the field, profile and type of public institution.

In the current literature, both at national and international level, there have not been many studies on alternative financing options for public institutions, especially the national defense field (Filip, 2001).

Our study aims to investigate the specific links existing in the financing of the defense sector between the total budgets, the assigned revenues of the defense institution, the gross domestic product (GDP) and the public debt of Romania.

In order to achieve our goal, we will analyse:

1. The link between the total budget of the MApN, the own revenues budget of the MApN and GDP using the descriptive statistics and the Principal Component Analysis (PCA) as research methods;

2. The correlation between the MNP's own revenue budget, GDP and government debt, using the Multiple Linear Regression.

1. Analysis of own revenues in correlation with the defense budget and gross domestic product (GDP)

Through this section, using the analysis of the main components, we will analyse the total budget of the national defense institution, its own revenues and gross domestic product over a 10-year period (2008-2017).

The PCA method consists in determining the own vectors and the values of correlations matrix associated with the set of analysed variables (Pintilescu, 2017). Further, we present how to perform the PCA method and the results obtained using SPSS program.

Table 1. The evolution of the total annual budgets, the annual budgets from own revenues of Ministry of National Defense (M.Ap.N) and GDP during 2008 and 2017

YEAR	Buget_tot	Buget_vp	PIB
An_2017	16.322.286	601.672	858.300.000
An_2016	11.230.284	882.187	765.100.000
An_2015	7.357.396	1.078.316	712.700.000
An_2014	9.373.143	1.029.398	669.500.000
An_2013	5.692.856	447.951	637.500.000
An_2012	7.577.402	291.447	596.700.000
An_2011	4.800.477	370.525	557.300.000
An_2010	7.000.749	189.182	522.600.000
An_2009	7.651.916	260.237	501.100.000
An_2008	8.342.796	165.304	514.700.000

Source: Ministry of National Defense budget information, available at: <http://www.mapn.ro/buget/>, (accessed on 21.11.2018) and statistical information from the National Statistics Institute available at: <http://www.insse.org.com/cms/en/tags/release-annual-gdp/>, (accessed on 21.11.2018)

Table 1 presents the variables considered in this analysis as: Annual total budget (Budget_tot), Annual revenue of own revenues (Budget_vp) and Gross Domestic Product (GDP), expressed in thousands.

The average level and the standard deviation calculated for each variable are presented in Table 2.1 (Descriptive Statistics output).

Table 2. The average level and the standard deviation for Buget_tot, Budget_vp and GDP variables

Descriptive Statistics

	Mean	Std. Deviation	Analysis N
Buget_tot	8534930.50	3267818.815	10
Buget_vp	531621.90	348041.992	10
PIB	633.543	118.5681	10

Source: Processed with SPSS, based on the data in Table 1.

The analysis of Table 2 shows that the statistical units have a total annual average budget of 8534930.50 thousand lei, with a standard deviation of 3267818.815 thousand lei, an average annual budget of own revenues of 531621.90 thousand lei, with a standard deviation of 348041.992 thousand lei. Annual GDP reached an average of 633,543 lei with a standard deviation of 118.5681 thousand lei.

The correlations matrix is a symmetrical square matrix, obtained by matrix product of table no. 1, originally X, with its X^T transposed. This is presented in Table 3.

Table 3. Correlation Matrix^a

		Buget_tot	Buget_vp	PIB
Correlation	Buget_tot	1.000	.310	.763
	Buget_vp	.310	1.000	.703
	PIB	.763	.703	1.000
Sig. (1-tailed)	Buget_tot		.192	.005
	Buget_vp	.192		.012
	PIB	.005	.012	

a. Determinant = .159

Source: Processed with SPSS, based on the data in Table 1

The correlation coefficients between variables show that there is a strong direct link between the Buget_tot, Budget_vp, and PIB variables. In the system of factorial axes, the points represented by these variables will be located in different quadrants (Pintilescu, 2017).

X^2 statistic is used to test the hypothesis of independence of the analysed variables. Thus, we formulate the H0 hypothesis that admits that there is no statistical link between the variables. The H1 hypothesis is the dependency hypothesis, which allows connections between variables. X^2 statistic is calculated based on the data in Table 1 and is presented in Table 4.

Table 4. Calculated value of X^2 test statistic

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.443
Approx. Chi-Square		13.159
Bartlett's Test of Sphericity	df	3
	Sig.	.004

Source: Processed with SPSS, based on the data in Table 1.

The calculated value is $X^2 = 13,159$. The significance level corresponding to this value is (Sig = 0.004) < 0.05, so the hypothesis H0 is repelled. This shows that there are statistical links between the variables. The own values of t correlations matrix are calculated and presented in Table 5.

Table 5. Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.204	73.458	73.458	2.204	73.458	73.458
2	.692	23.056	96.514	.692	23.056	96.514
3	.105	3.486	100.000			

Extraction Method: Principal Component Analysis.

Source: Processed with SPSS, based on the data in Table 1.

The maximum value of 2,204 is the one corresponding to the first factorial axis. The 0.692 own value corresponds to the second factorial axis. Thus, the most significant differences between the statistical units (reference years) observed from the point of view of the registered variables are highlighted on the first factorial axis, which presents a variant of a high weight (72,458%). The results obtained on the two factorial axes calculated and presented in Table 6.

Table 6. Component Matrix^a

	Component	
	1	2
Buget_tot	.814	-.558
Buget_vp	.776	.616
PIB	.969	-.024

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

Source: Processed with SPSS, based on the data in Table 1.

These values represent the coefficients of the linear equation that show the importance of each variable in the formation of the first factorial axis. In Table 7 the results for the first and second factorial axes are presented.

Table 7. Component Score Coefficient Matrix

	Component	
	1	2
Buget_tot	.369	-.807
Buget_vp	.352	.891
PIB	.440	-.035

Extraction Method: Principal Component Analysis.
Component Scores.

Source: Processed with SPSS, based on the data in Table 1.

As a result of the determinations made on the formation of the factorial axes by the variables considered in the analysis, we present the representation of the variables on the first two factorial axes made in Figure 1.

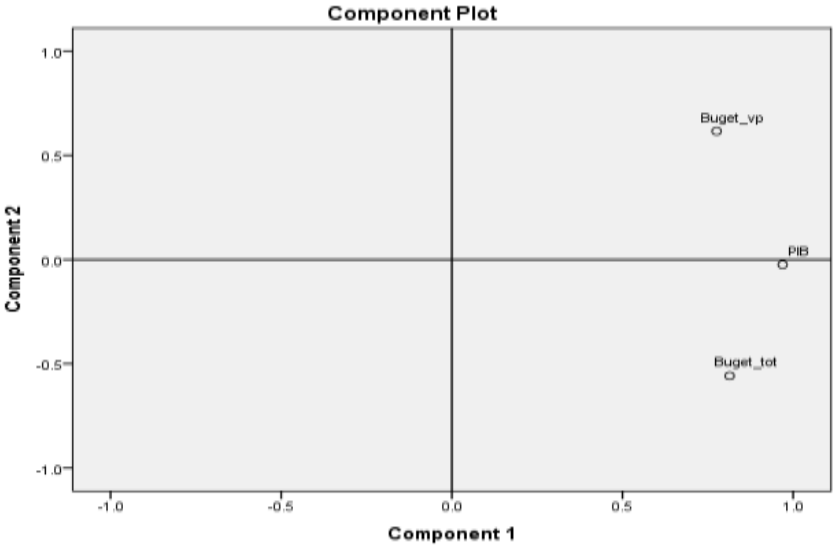


Figure 1. Representation of variables on factorial axes

Source: Processed with SPSS, based on the data in Table 1

Analysing Figure 1 we can see that the horizontal GDP variable has a strong positive correlation with the first factorial axis. The second factorial axis shows a strong correlation between the Buget_tot and Buget_vp variables, represented vertically, but of the reverse link type. In Figure 2 are represented statistical units, materialized in periods expressed in years.

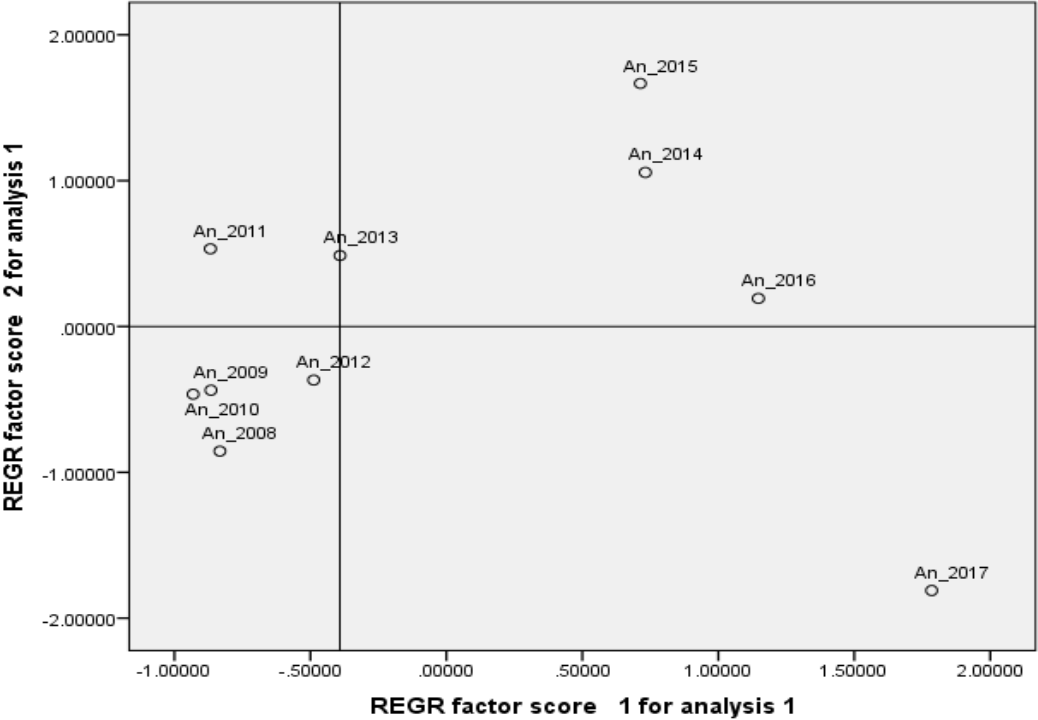


Figure 2. Representation of statistical units on factorial axes

Source: Processed with SPSS, based on the data in Table 1

The first factorial axis reveals a non-homogeneous relationship between the horizontally grouped statistical units comprised of An-2016 and An_2013, an_2012, An_2011, An_2010, An_2009, An_2008, which are in negative correlation. On the other hand, the units An_2005, An_2014 and An_2017 are located vertically, forming on the second factorial axis a homogeneous but inverse connection.

O explain the positive and / or negative influences manifested by the statistical units in correlation with the variables considered in the analysis on the two factorial axes we will visually "overlap" the graphs presented in Figures 1 and 2 (Pintilescu, 2017).

From the analysis carried out by overlapping the representation of variable points and unit points we can see that in the years 2014-2017 the gross domestic product has increased sharply compared to the period 2008-2013 when its values have been in negative correlation with relatively low increases and decreases. GDP values in 2014-2016 have a positive correlation and influence on the Buget_tot and Buget_vp variables, with annual growth. On the other hand, in 2008-2013, even in 2017, the Buget_vp variable had a negative correlation with GDP and Buget_tot. We also appreciate that the Buget_tot and Buget_vp variables have a strong reverse link, which has a low unit-level influence.

Considering the sources of self-financing and their insignificant share in the Ministry of National Defense (M.Ap.N.) budget, the categories of expenditures related to the defense sector specific activities for which no potential resources are identified in the public budget or the own revenues budgets are practically present, staggered over several financial years, or are postponed for the coming years.

If in the market economy self-financing is preferable to economic entities and they manage to ensure their own development, in the case of Ministry of National Defense (M.Ap.N.), the specificity of the performed activity does not allow a level of self-financing adequate to achieve all the proposed objectives.

2. Analysis of own revenues in correlation with the defense budget, gross domestic product and public debt

We will perform the multiple line regression analysis using the following data:

Table 8. Evolution of Total Annual Budgets, Annual Budgets of M.Ap.N's Income, GDP, and Public Debt between 2008 and 2017

Year	Buget_tot	Buget_vp	PIB	Dat_pub
An_2017	16,322,286	601,672	858,300,000	300,405.0
An_2016	11,230,284	882,187	765,100,000	285,994.7
An_2015	7,357,396	1,078,316	712,700,000	270,120.7
An_2014	9,373,143	1,029,398	669,500,000	263,153.4
An_2013	5,692,856	447,951	637,500,000	240,777.0
An_2012	7,577,402	291,447	596,700,000	221,872.7
An_2011	4,800,477	370,525	557,300,000	193,216.7
An_2010	7,000,749	189,182	522,600,000	159,686.9
An_2009	7,651,916	260,237	501,100,000	118,428.0
An_2008	8,342,796	165,304	514,700,000	69,020.4

Source: Ministry of National Defense budget information, available at: <http://www.mapn.ro/buget/>, (accessed on 21.11.2018) and statistical information from the National Statistics Institute available at: <http://www.insse.org.com/cms/en/tags/release-annual-gdp/>, (accessed on 21.11.2018)

Table 8 presents the analysed variables as it follows: Annual total budget (Budget_tot), Annual revenue of own revenues (Budget_vp), Gross domestic product (GDP) and Public debt (Dat_pub). All variables are measured in thousand lei.

In the analysis, we will try to see if there is a dependency relationship between the Annual Budgets of Own Income (Buget_vp), the dependent variable and the Gross Domestic Product (GDP) and Public Debt (Dat_pub), the two variables defined as independent.

The first variable GDP could influence the revenue generation activities in the defense sector, while the Dat_pub variable could attract the financing of some activities through reimbursable funds obtained from the foreign market.

We will perform the Multiple Linear Regression on a database containing statistical data on the budgets of the defense institution, its own revenue budgets, Gross Domestic Product and the public debt of Romania for a period of 10 years between 2008 and 2017.

Table 9. Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Dat_pub, PIB ^b		.Enter

a. Dependent Variable: Buget_vp

b. All requested variables entered.

Source: Processed with SPSS, based on the data in Table 2

Table 10. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.768 ^a	.590	.472	252843.132	.590	5.027	2	7	.044

a. Predictors: (Constant), Dat_pub, PIB

Source: Processed with SPSS, based on the data in Table 2

The specified model explains 59% of the variance of the Buget_vp dependent variable.

Table 11. ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	642691509945.667	2	321345754972.833	5.027	.044 ^b
	Residual	447507546815.233	7	63929649545.033		
	Total	1090199056760.899	9			

a. Dependent Variable: Buget_vp

b. Predictors: (Constant), Dat_pub, PIB

Source: Processed with SPSS, based on the data in Table 2

Table 12. Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
(Constant)	-317739.731	582895.150		-.545	.603	-1696067.739	1060588.278		
¹ PIB	.000	.002	.108	.205	.843	-.003	.004	.211	4.748
Dat_pub	3.053	2.404	.670	1.270	.245	-2.632	8.739	.211	4.748

a. Dependent Variable: Buget_vp

Source: Processed with SPSS, based on the data in Table 2.

The result in the Coefficients table shows that the GDP variable has no significant influence on Buget_vp. The model is weak, because sig. is $0.603 > 0.05$. The Tolerance Indicators > 0.10 (0.211) and VIF < 10 (4.748) indicate that there are some multicollinearity issues, and the independent variables have a strong correlation between them.

Parameters interpretation:

- $b_0 = 317739.731$ (average value of Budget_vp when GDP is 0 is 317739.731);
- $b_1 = 0$ (the GDP variable does not affect the change Buget_vp; sig = $0.843 > 0.05$ reason why we will not interpret the result b_2);

- $b_2 = 3.053$ (the dat_pub variable does not affect the variance Buget_vp; sig = $0.245 > 0.05$ why we will not interpret the result b_2);

Thus, it can be said that the variables GDP and Dat_pub have no significant influence on the dependent variable, so that the explanatory model will not contain a representative influence factor.

For the developed model, we verified the assumptions about errors.

a) The average of errors is null

Table 13. One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Unstandardized Residual	10	.0000000	1428748.59911726	451809.97769854

Source: Processed with SPSS, based on the data in Table 2

Table 14. One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Unstandardized Residual	.000	9	1.000	.00000000	-1022065.1772744	1022065.1772745

Source: Processed with SPSS, based on the data in Table 2

When verifying the Media Error assumption is null, sig. The test statistic is $1,000 > 0,05$, which allows us not to reject the null hypothesis. With a probability of 0.95 it can be stated that for the specified model, the average of the errors is null (the model fulfills the hypothesis).

b) Errors are homoscedastic

Table 15. Correlations

			PIB	Dat_pub	ert_abs
Spearman's rho	PIB	Correlation Coefficient	1.000	.988**	.273
		Sig. (2-tailed)	.	.000	.446
		N	10	10	10
	Dat_pub	Correlation Coefficient	.988**	1.000	.297
		Sig. (2-tailed)	.000	.	.405
		N	10	10	10
	ert_abs	Correlation Coefficient	.273	.297	1.000
		Sig. (2-tailed)	.446	.405	.
		N	10	10	10

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Processed with SPSS, based on the data in Table 2

To verify the hypothesis of homoscedasticity, we verified the Spearman correlation coefficient between the independent variables and the errors in absolute value for the obtained model. Its value sig. for both independent variables is greater than 0.05, which means we do not reject the null hypothesis that errors are homoscedastic. (Pintilescu, 2017)

c) Errors are normally distributed

Table 16. One-Sample Kolmogorov-Smirnov Test

			Unstandardized Residual
N			10
Normal Parameters ^{a,b}	Mean		.0000000
	Std. Deviation		1428748.59911726
	Absolute		.279
Most Extreme Differences	Positive		.165
	Negative		-.279
Kolmogorov-Smirnov Z			.884
Asymp. Sig. (2-tailed)			.416

a. Test distribution is Normal.

b. Calculated from data.

Source: Processed with SPSS, based on the data in Table 2

To verify this hypothesis we used the Kolmogorov – Smirnov test. Since sig. = 0.416 > 0.05 we do not reject the null hypothesis and we can assert 95% probability that errors are normally distributed.

d) Errors are not autocorrelated

Table 17. Runs Test

		Unstandardized Residual
Value	Test Value ^a	480577.50645
	Cases < Test	5
	Cases >= Test	5
Runs	Total Cases	10
	Number of	8
tailed)	Z	1.006
	Asymp. Sig. (2-	.314

a. Median

Source: Processed with SPSS, based on the data in Table 2.

Since the value of $\text{sig.} = 0.314$ is lower than the 5% risk, we reject the null hypothesis. With a probability of 95%, we can say that the errors are autocorrelated and the model does not fulfill this hypothesis.

We can say that by developing the multiple linear regression model with the two independent variables (GDP and Dat_pub) we could not prove the variance of the dependent variable Buget_vp. It is obvious that the variables GDP and Dat_pub do not have a significant influence on the dependent variable, so that the explanatory model does not contain a representative influence factor.

The absence of a significant correlation as mentioned above shows that the evolution of own revenues during the investigated period is mainly related to the variation of the budget component of the defense institution and to the regularity of the self-financed activities as a source of income. On the other hand, we consider it a positive thing that the analyzed own incomes do not have a significant impact on the accumulation of public debt under peace.

Conclusion

Following the analysis of the results obtained from the testing carried out on the basis of the two models, it is noticed that in the national defense sector there is a potential of using the financial resources obtained from own revenues achieved by carrying out a relatively small number of source activities.

In peacetime, the annual budget allocated to the institution significantly influences the evolution of self-funded activities, amid a moderate influence of GDP on them and without affecting public debt.

The principle of self-financing of specific activities can be implemented on a wider scale by extending the services that the specificity of defense can offer to civil society. Accessing non-reimbursable funds by the military institution is a financing opportunity that can positively influence the revenue budget by developing on specific and eligible activities.

Economically, increasing the share of own revenues in the total national defense budget positively influences the impact of the national public budget. Socially, the relationship with the civilian environment through different self-financed activities achieves a better cohesion and promotion of the image of the military institution.

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THE IMPORTANCE OF THE UNMANNED UNDERWATER VEHICLES IN NETWORK CENTRIC WARFARE

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Abstract:

The development of the concept of network centric warfare, with the underwater component, is the main direction of having information superiority in the operational environment. The joint character of operations cannot be imagined without information dissemination of the engagement space. Technological advances and increased complexity of command and control systems and interconnection with combat platform sensors, coupled with the cyber warfare of the engagement area, led to the strengthening of a type of war where knowledge of the real-time situation is a key element. The impact of autonomous underwater vehicles in network centric warfare is a major one in terms of complementary with present capabilities and multiplier effect.

Keywords: *network centric warfare; unmanned underwater vehicles; information superiority.*

Introduction

The concept of network centric warfare (NCW) corresponds to the beginning of a new phase in the development of advanced warfare concepts. It is a technological border domain that is currently accessible only to entities that have high-tech technologies, information technology and the hardware and software structures needed to use them. Military conflicts are part of the social dynamics in and therefore, they need to be analyzed and interpreted in conjunction with the main sociological characteristics and the tendencies that manifest themselves in its dynamics. From this perspective, military conflicts are defined on such a dynamic and can only be solved in its entirety.

The typology of the new military conflicts will continue to be one of them forms of violent manifestation of political, economic and social conflicts. Their main characteristics will be dependency, in the sense that they will increasingly be conditioned strictly by political, economic and social factors, such as global, regional and national political, economic, information and social strategies. No military conflict, however insignificant, can be viewed and treated as an isolated fact as a matter exclusively for those directly involved. Each of these conflicts will increasingly impose a global solution to solve it, which implies the involvement of the international community, practically, of everyone and everyone.

Under these circumstances, centric warfare, although it tends to gain an important dimension of the battle space (generally armed confrontation), is not accessible to any actor and, according to the tendencies analyzed, will fail to exercise either its pre-emptive function or the dissuasive one. Irrational and extremist actions manage, for the time being, to balance the strategic relationship and even to jeopardize major technological powers, alliances, coalition forces and international entities. But it would be a mistake to consider that all actions and reactions against the process of globalization, of technological and information dominance are of a pathological nature. Military conflicts have their causes, in general, in conflicts of interest, in the battle for power.

NCW is a new concept that operates both with new and already existing means. No one can afford to change overnight the whole armament and the whole equipment and replace it entirely with one that NCW is requesting. Particularly, one of the important functions of this concept is to ensure the optimization and integration of the hiring space, which implies a process of adapting the existing means to the NCW requirements. The essence of this concept is network communication. However, this communication is not carried out on the principle of classical broadcast networks. Networks used in NCW provide complex communication (simultaneous and, at the same time, selective and targeted in real time, depending on the mission's specific requirements).

1. Network Centric Warfare Concept for Maritime Operations

The concept of network-centric warfare (NCW) should be a key element of the Navy transformation doctrine. NCW is centered on using computers, high-speed data links and networking software to connection military personnel, warships, and tactical formations into vastly integrated local and wide-area networks. Within these networks, the staff will share great amounts of vital information on a fast and continuous root. We consider that NCW will dramatically improve warfare capabilities and efficiency.

Is there a proper time and place for less in size navies in network-centric warfare concept? Will they be capable to input any kind of improvement in perspective combined naval operations? Or will they be entrusted to the borderlines, undertaking the most menial of missions, encouraged to stay out of the loop—or stay in the harbor? If we consider the recent experiences of some capable but small navies, then we have the right to be uptight about their future in network-centric operations¹. For while we should consider that Navy has achieved a high degree of success within multinational operations or exercises. To date, the main issue posed by the revolution in military environment in general and network-centric warfare (NCW) in particular has been analyzed in terms of technology and budget². An important part of what has been considered radical improvement in the revolution in military field is not so advanced from a naval perspective. Navies have been deal with information technology since 1957, when the CANUKUS Naval Data Transmission Working Group, after a period of three years of debates, approved the technical standard for data exchange³. Link 11 is more or less standard among NATO countries. The first use is to share tactical data so as to realize what is today known as *common maritime operational picture* within a naval group. Later on the Link 11 data system was used by the NATO navies to transmit certain engagement directives. For some cases, especially in a multi-threat environment, Link 11 is relatively slow. Due to compelling lag time intervals among moments of target detection and the marking of data onto the Link network, its data is not of fire-control character. Further, it passes to linked ships only the data that has already been processed on board the contributing ship. This occasionally leads to duplicate tracks or conflicting information about the same target. To use Link 11 it is necessarily a high performance of professional abilities on the field of targets coordinators in order to have a clear operating picture. NCW means at raising the efficiency of the reassign of naval data among involving nodes (or ships). By optimizing the effectiveness of military actions throughout information switch over, even undersized naval

¹ James Tritten, *Revolutions in Military Affairs: Paradigm Shifts and Doctrine*, Newport Paper 9, Newport, R.I.: Naval War College Press, 1995, p. 8.

² David C. Gompert, Richard L. Kugler, and Martin C. Libicki, *Mind the Gap, Promoting a Transatlantic Revolution in Military Affairs*, (Washington, D.C.: National Defense Univ. Press, 1999), p. 12.

³ First time was named the *Tactical International Data Exchange* (TIDE), it later improved in Link 2 in the Royal Navy, which was already using forms of data-sharing technology to distribute tactical information among its ships. As other NATO links became established, Link II became known as *Link 11*. Norman Friedman, *World Naval Weapons Systems 1997–1998*, Annapolis, Md.: Naval Institute Press, 1997, p. 28.

groups can produce supplementary combat influence. Information is controlled by a series of forceful and interlinked *crisscross*: sensor grids collect the data, information grids combine and analyze it, and engagement grids supervise the output information. Enhanced operational effectiveness outcomes not only from the better rate at which military actions can advance but also from the *self-synchronization* that is generated among maritime units. This rate and synchronization eventually join together the strategic *recognized maritime picture* with general operational and tactical framework. For example, onboard warships, the recognized maritime picture is provided to naval platforms by shore-based capabilities, whereas ship-based sensors and tactical data links produce local data. With the assimilation of information into a shared pool allocated by linked systems, plans and actions will develop into much more forceful. They will be capable to respond instantly to transformation in the engagement space, by asset of their improved alertness of them. For naval forces having such potential, the consequence is a competitive improvement, a skill to achieve success while locking out adversary plan⁴. The new necessity to increase reaction rates arose in the recent asymmetric conflicts in order to face with hypothesized air attacks on surface ships; the current movement for speed and synchronization is the comeback of fleet operations to their conventional settings, in and around the coast lines. The absolute density of maritime and air traffic, the existence of naval, merchant and recreational maritime platforms, results in a stage of complexity that blue-water operations not often come across. In the littoral, there are not many places where a warship does not stand out, whereas defenders are afforded a large amount of opportunities to put out of sight their forces, whether in nature or through deception, basing them on industrial platforms. In fact, naval forces are forced on an *asymmetrical* engagement space near the coast. In reply, networked concept operations allow superior speed and synchronization, which create prognostic planning process and preemption, resulting in proactive, effects-based operations. Such kind of operations is based on integrated force management, allowing a better management of missions and resources as well as a better execution of time-critical missions.

Developments in autonomous systems notwithstanding, the task of the operator behind the device will continue to remain significant and important. This issue is similarly pertinent to Network Centric Warfare (NCW). The accomplishment of NCW is based on the concept that some data is only valuable if it makes possible more successful action. From our perspective, the main approach to achievement of NCW is not technology itself but people involved who will make use of it – the human aspect, which is built on qualified mastery and assignment command that needs high standards of instruction, schooling, doctrine, association and management. Fundamentally it is related to perspective of how military organizations work in partnership to share their knowledge of the condition with the intention of fight more efficiently. The human element of the architecture of NCW is the centre of a composite concept.

NCW is based on the concept of linking many platforms into one, with the ability of common alertness network with the main purpose to gain information dominance, to catch the strategy of the adversary's decision loop, and finish the armed clash very fast. Quite the opposite of the NCW, conventional conflict is considered to be based on the platform-centric concept. The distinction between the two main models is that in traditional platform-centric warfare, one part has to gather the power to mass combat efficiency for the reason that each weapon structure acts autonomously, whereas in network centric warfare the results are massed, quite than force. For this reason, but not only for it, the use of weapon systems is adapted so that an objective is considered by the most successful system in that network. Thinking to this, it is assumed, the results of massing power could be achieved with a much reduced scale of force. The naval forces and the C4ISR architecture are tracking the appliance

⁴ Richard Scott, *Survival of the Fittest*, Jane's Defence Weekly, 23 January 2002, p. 19.

of this theory to warfare. Network centric warfare is focused on the idea of some important network grids:

- *Data Network Grid*: The data grid gives the support to obtain, analyze, reassign, stock up, and shield information for the joint forces in the battlefield.

- *Sensor Network Grid*: This kind of grid is necessarily for system that exploits the sensors in the data grid applicable to a specific mission. It is configured not only for usual warfare sensors such as radar including inserted logistics sensors to follow resources. This type of grid is customized for each mission.

- *Fight-Commitment-Shooter Grid*: All types of sensors and war combatant components of the warfare network are assigned to strike in the fight grid. This type of grid, like the detection tools grid, is active, using a distinctive mix of belligerents and sensors for every allocated mission. The last two grids are entirely incorporated in the data network grid. As we can notice, each grid is formed by nodes symbolized by particular sensors, weaponry, or command and control ships and is associated via data link and specific communication means.

The binomial perspective of sensor and fight grids is not essentially seen as a widespread concept. In many situations they have overlapping elements. For instance, the sensor grid starts searching on a cruise missile and persists to follow as the significant unit engages and destroy is completed. Network centric warfare compresses the command and control circle. Commanding officers of the warships can transmit their intentions through the structure of computer algorithms or relaying orders directly among each unit. NCW advances in the direction of computerized optimization of the locations of units in a task group and engagement of adversary forces using this new capability concept.

2. The difference between the mission space and the battlespace using information superiority

Information superiority is defined in military concept as a condition that is gained when superior advantage is resulting from the capability to take advantage of a superior information situation. In military actions this kind of superior information pose is, more or less, obtained from information processes that protect our capacity to accumulate, analyze and distribute a continuous stream of data while developing and/or disallowing an enemy's capacity to act in the same manner. Gathering information superiority enhances the tempo of commanders preempting enemy options, establishes alternative options, and develops the efficiency of adopted solutions. This undertakes to get military actions to a profitable conclusion more quickly at a lesser budget. The outcome is represented by the capability to amplify the tempo of military actions and to preempt enemy plans and intentions. Information superiority is created and developed by assuming the NCW concepts.

The main characteristic for significance design in combat operations is formed by the detection, identification, and removal of the most essential military targets at any specific time. The biggest issue is based in fleeting marks, those that are portable and whose significance is time responsive. The assignment space appropriate to our nationwide security is growing and becoming more intricate. The Romanian Naval Forces, as a high tech branch, has a key position to play in national military capabilities architecture. Our duties and responsibilities are somewhat changed from those we had in previous decades. Quite a lot of important distinctions influencing military concepts and operations have been already manifested. First of all, primary is the increasing weight of operations other than war (OOTW) in which military institutions are being assigned to do a various panel of non-traditional duties, from humanitarian relief to peace enforcement.⁵ Secondly, while these diversity derives from geopolitical concerns, other adjustments in the mission space are stem

⁵ Vadm Arthur K. Cebrowski, USN, *Network Centric Warfare: An Emerging Military Response to the Information Age*, Command and Control Research and Technology Symposium, Naval War College, Newport, RI, June, 1999, p. 28.

by knowledge and technology. Third, is the appearance of the opportunities of a completely new type of war, which is called *Information Warfare*, or possibly more commonly, *Infrastructure Warfare*. At the end, non-linear shape of war has developed into considerably more effective with the amplified lethality and ease of use for weapons of mass destruction (WMD). Each one of these transformations has an essential repercussion for the sort of capabilities we require and the limits and stresses which are set upon us. The responsibility of a various panel for OOTW missions involves right to use new concept of warfare and information filter.

From another perspective, the battlespace of the 21st century is going to be characterized by the mission space and in a different way by the especially scenery of the Information Age. The concept of the battlespace recently has been changed to battlefield to suggest a common sense that the duty environment or competitive freedom includes faraway more than a proximate physical position. At the jeopardy of generalization, the concept of Information Age is shifting the battlespace in three elementary means. The first one refers to the extension of the battlefield as just stated. The second issue is considered the character of soldiers in the battlespace, and the last one is in its failure of confidentiality and inaccessibility.

At the time when these advances in military systems are mixed with improvements in capabilities related to sensors and analysis, concerted military power is to represent high-valuable objectives that will turn into progressively more defenceless in the Information Age. Moreover, as the Information Age is creating information accessible more or less everywhere, nearly anytime, and at a very affordable budget, it is not having the similar consequence on transportation for combatants and logistics. One of the most challenging aspects is that we will be in front of some ascertain the individuality and position of our enemies in the battlespaces for future warfare actions. Even in conventional war situations, one can suppose that significant endeavours will be completed to turn into furtive and widen disguises. If in the situation that what could be seen can be dependably killed, then the reply will be to keep away from being noticed and therefore the battlespace is going to turn into a place to take part in hide and seek.⁶ Nowadays robotic systems have a reasonably complicated set of capabilities on-board. This scale of intelligence facilitates them to be fired, possibly to be modernized with the most recent information, and elapsed, leaving the lethal phase to the robotic weapon that hold the target and hunt it if needed. Intelligent weapons only require being capable to find the way to a position in space and time. All other capabilities would be integrated into the information technology arrangement. The benefit of this approach is going to be analysed together with implications.

The second and third major adjustments both include decoupling. One includes the removal of stove-pipe antenna weapon pairings. Information technology will offer the ways to attain superior interoperability and modify the environment inducements and realistic concerns that frequently force us towards point results. This is the uneven correspondent of shifting from producing guns one-by-one by handmade, to robotized way of making them with compatible components. The other includes splitting sensors and operators from the platforms that bring them today. Platforms such as ships provide a large amount of purposes. The Information Age makes available for us unconventional ways of accomplishing a quantity of these for the initial time. In the middle of the facilities the traditional platforms offer are shipping, power, assimilation, and connectivity to assessment responsible. Nevertheless, platforms have big footprints and are not easy to make them stealthy. In addition to this, traditional platforms are high costly to produce, operate and defend. The

⁶ Stuart E. Johnson and Martin C. Libicki, *Dominant Battlespace Knowledge and Its Consequences*, Washington, DC: National Defense University Press, 1995, p. 34.

financial matters of platforms and the power configuration border the number we can afford and run. The restricted quantity reduces our suppleness to place them in order to act in response to immediate situations and their high value amplifies their importance as targets. Network centric warfare has the potential to increase the significance of existing maritime platforms by extending the efficient distance of their systems of sensors and weapons. The acquired progress in technology supplies the chance to shift the functionality offered by maritime platforms to the informatics structure, the sensors, or the warfare actors, consequently allowing us to split functions from traditional warships.

The fourth transformation is the necessity to create and set up a host environment for new sensors and operators. Sensors created to perceive new effects and manoeuvre in close to make differences among different equipment, so that we cannot now make a distinction and operators planned to attain innovative effects while at the same time becoming far more silent. Information operations are the most critical in furtiveness. For instance, one of the utmost confrontations in information operations is merely to be acquainted with the situation when one part is under assault. For the moment, it is a vision about the development of working on a new type of disruptive sensors that could supply this kind of information. These require to be improved if we consider having enough defence's capabilities in this area. The net outcome of all of these improvements will be the propagation of lesser price, stand-alone sensors and operators that will supply to and depend added upon dispersed rather than embedded intelligence.

3. The role of Unmanned Underwater Vehicles in the maritime Network Centric Warfare

We consider the power of Network Centric Warfare being a result from empowering the entire assessment architect in the battlespace quite than just a few. The reality of the environment and the nature of complexity and battle rhythm will conduct us to this exploit of the network. The main objective represents to have all our relevant actors and skills into the common framework at the same time. The capacity to strike numerous high-valuable targets at the same time provides us the ability to utilize a strategy of surprise and fear that can conduct a condition to an ending far more hastily than an attrition-based strategy.

As I mentioned above and as its name entails, NCW converge on obtaining the possible benefits of connecting all factors from battlespace in a robust network. As a result, this concept allows them to act in common manner to accomplish synergistic results (but not seen as a necessary requiring them to constantly manage in a linked manner). NCW is created around the theory of sharing valuable data, information, knowledge and assets and networking is suitable to do this. Linking battlespace capabilities and relevant actors together will significantly amplify warfighting effectiveness in a manner that conducts us to acquire more use out of our warfare environment units. We know how to understand the foundation of increased combat connected with network-centric military actions by first analyzing the combat effectiveness of naval platforms or network nodes acting in a separate mode. With the aim of effectively engage a target, all of the subsequent actions are required to be completed within a certain time framework. Primary, the target has to be detected. Next, it is required to be identified. Third, the assessment to engage the target has to be done. Fourth, the conclusion should be passing on to a weapon system. Finally, the weapon system must be aimed and fired. Related with a specific engagement is a time financial issue and striking distance. The time cost fluctuates significantly as a meaning of whether the target is movable or using countermeasures. Therefore, opposing to some stated concerns, NCW does not certainly follow the path to centralized control. In reality, starting with the explanations done so far it looks to be an improving concept of the road to improve awareness for all factors with more cooperation and decentralization in the shape of self-synchronizing capabilities.⁷ As we can

⁷ ***, *Executive Summary of Global '98 Wargame*, Naval War College, Newport, July , 1998, p. 86.

consider and implement the concepts of Network Centric Warfare to the running of battlespace filtered information, we can anticipate that, in unconditional terms, each part is going to be more informed about the future battlespace than still some, if not all of, the better-informed structures are at the moment. In the near future we can predict that at the commanders acting at tactical level will cover a better discerning of equally the big depiction and the local condition than commanders acting at operational level currently have today. The prospective for information excess is valid and enormous care must be taken to put together in a proper path that what is offered is in fact valid information and not noise.⁸ Besides, the access to accurate instruments and knowledge will be requested to reach battlespace knowledge. Component of the challenge stand in front of military leaders will be to extend a superior understanding of situational requirements and to supply the essential tutoring and training to trade with the sudden increase of information.

We believe that information technology has a considerable impact on the planning and management of military operations at sea. This phenomenon is very visible when we analyze the concept of sea control. In this case, in the information age, efforts at sea need concerted control from the start, with action on obtaining information superiority or blocking access to information where the opponent. Thus, this phase becomes an integral part of the operational concept of obtaining or maintaining control of the sea. Autonomous systems maritime allow us to achieve information superiority by the ability of such equipment to process data and provide options for action, providing technical capabilities for collecting, processing and dissemination in a constant flow, while exploiting vulnerabilities enemy or blocking access to the information. From a certain perspective, we can make an analogy between getting control of the sea and controlling the information space.

Current and future information management technologies will set footprint and cover not only the space of employment, physical (land, air or maritime), but also the information space - cyberspace. The existence and growth of the importance of the fourth dimension of the space of cyberspace will cause the conceptual boundaries of war to become blurred and unstable within a short space of time. As a consequence of this we will be able to see a condensation of the time factor in the future. This effect will occur as a result of the ability of robotic systems to collect, evaluate, use, transmit, and multimodal transfer large amounts of information at higher speeds and to multiple users.

Underwater unmanned vehicles will be able to develop multiple functionalities, being assimilated as diverse sources of information but linked to each other and organized into an ISR architecture in support of task force (TF) or task group (TG) naval groups. Finality is a much faster response time and a dynamic decision-making cycle tailored to the needs of the mission. The doctrinal transformations that autonomous robotic systems will impose on time and space will accelerate the pace of combat at sea. The forces that will win the fight in time and hold the information superiority, as well as control over the opponent's reactions, will be in a position to execute the surprise of the enemy and therefore to have the initiative. From our analysis, information superiority will be one of the main operational level goals to gain the advantage of the pace of the operation and the freedom of manoeuvre in the engagement area.

The technologies introduced by the autonomous systems and information technology will lead to a drastic reduction of the time allocated to the planning, preparation and conduct of military actions at sea or in joint operations. The information that commanders will have at their disposal for the management of shipping groups at sea will be disseminated to subordinate units quickly and with greater accuracy and will be displayed using digital technology - via encrypted and video data transmissions. This information support will make

⁸ Goodden Thomas, *Education Technology in Support of Joint Professional Military Education in 2010*, Ed. Tech Report, Washington, October 1998, p. 34.

available to on scene commanders the tools through which they can visualize the situation in the operating area and can process and transmit critical information in video format. The commander will have the ability to convey in an explicit manner his intention and CONOPS to all command levels. In our view, the application of the concept of war based on the network in the naval field has a number of advantages, the most important being the multiplication of the fighting power of our own forces. This power derives from superior processing of information, easy user access and dissemination speed, unlike the industrial era where combat power was given by the number of combatants and combat equipment. If the traditional elements of combat power, such as fire power or troop mobility, can be readily quantifiable, in the case of determining measurable indicators of fighting power in the information spectrum, this is difficult to achieve. The problem of real power determination the struggle is due to the existence of multiple immaterial factors, which cannot make it possible to determine by measurement. In network-based warfare, excessive centralization leads to a reduction in the multiplier effect induced by information technology. In fact, the use of autonomous systems within a network-based architecture starts from the principle of multiple polarity and decentralization of the decision. Other factors that diminish the success of network operations in which we use autonomous underwater vehicles and information technology are the low level of training and understanding of the complex hiring environment by operators, the low level of competence of commanders in adapting to new specific conceptual developments of the IT field, as well as the reduced adaptation of the state to the rapid pace of processing and dissemination of information products.

Naval forces are conducting military actions at sea, in the area of responsibility, to ensure freedom of navigation and access to international waters and to discourage any threat to sea lines of communication (SLOC). From the perspective of antisubmarine warfare's challenge of fighting at sea, it becomes a critical and immediate need to build and maintain effective ASW capabilities either by upgrading or replacing existing ones, or by building a hybrid between existing platforms (ships, aircrafts) and modern, autonomous or semi-autonomous means (underwater vehicles, fast surface vessels, etc.). These actions allow the Naval Forces to further ensure success in protecting their own forces and maintain SLOC free and safe for navigation. The domain of the antisubmarine warfare is unique, primarily from the perspective of the complex environment and the variable environmental characteristics, and secondly from the particular aspect of the command, control and communications architecture. Many naval platforms have the ability to provide different levels of capabilities to meet the challenges of the undersea environment.

Conclusions

The advancement of innovative technologies, with the emergence of autonomous systems, requires the integration of space in a comprehensive approach, bringing together all combat environments: maritime, air, land, cyber, and space. From this integrated perspective, the Naval Forces participate with naval platforms and equipment specific to the maritime space, sensors, personnel, as well as the infrastructure required for building the network-based warfare architecture, as well as for information operations.

The development of the Naval Forces needs to be correlated with the complex and increasingly present challenges of the Black Sea security environment, and also with the sustained pace of development and evolution of the present technologies, but especially those that are supposed to have a major impact in the configuration of military operations. The enormous advantages that information technology brings at this moment, at the conceptual level, start from the common connection of the three traditional space-time-force factors, connected by information. We believe that information enhances the effect of the above-mentioned triad, both individually and through association. We can say that obtaining

information from the operation area and processing it efficiently in the shortest possible time will decisively influence the success of the military effort at the strategic, operational or tactical level.

In any architectural structure we design the use of unmanned underwater vehicles (UUV), it will have to follow the C4ISR typology. Starting from the capacity of underwater autonomous systems to be versatile, this equipment can be autonomous mini submarines, explosive cargo carriers, and underwater transport or immersion robots. Concurrently with the development of artificial intelligence and technology, UUVs will have an increasingly important role in maritime operations and will act as a multiplier tool of maritime forces.

From our analysis, a number of innovative concepts studied in this report highlight promising directions looking at challenging the supremacy of submarines in the underwater space. The main objective we proposed in the article was to determine the role of UUV in NCW concept of forces capable of executing multiple missions in an A2 / AD environment.

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MODERN SOLUTIONS TO CONSOLIDATE THE NATIONAL AIR DEFENSE. MEADS SURFACE-TO-AIR MISSILE SYSTEM – FROM PROJECT TO OPERATIONAL REALITY

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Abstract:

The current operational environment launches new challenges for the modern surface-to-air missile systems through a broadening range of air threats, in continuous development. To preserve their relevance in the increasingly complex and intense airspace, this category of weapon systems has to constantly change and adapt. MEADS surface-to-air missile system represents a new stage of this evolutionary trend and proposes a scalable and flexible solution to counter the present and future air threats. However, the road from design to production proves to be a long and difficult one, and the fate of this promising project is still uncertain.

Keywords: *air defense; MEADS; surface-to-air missile system; air threats.*

The nature of modern conflict suffered profound mutations, due to the accelerating globalization process and the rapid technological progress, touching all the aspects of our living environment. Starting from these two significant realities of the contemporary world, globalization and technological advent, augmented by a multitude of social and cultural elements, the modern conflicts and all the more the current and future ones, demands a comprehensive approach which tends to give priority to its political, economic and even informational components.

However, the use of the military forces in most of the modern crises continues to be demanded, even as an extreme or last resort option, due to the limited impact of the application of the other instrument of power.

As a consequence, while acknowledging the complexity of the contemporary crises and the necessity of a *comprehensive approach*, with the involvement of all the available tools, starting with the political/diplomatic one, there is still a persisting need to develop and maintain a sufficient military option. This has to be able to efficiently apply the military, either independently, or in support of the other instruments of power.

The military instrument remains an essential component of power, whose contribution can't be compensated or substituted by the application of other options. This was clearly demonstrated by the contemporary crises or the current ones which, invariably, demanded the use of military power despite the diplomatic, economic or other efforts, aimed specially at preventing the escalation towards this option.

For this reason, both the states and the other actors in the international arena, continues to invest substantial efforts to consolidate their military forces, by allocating significant financial, material and human resources in the pursuit of this goal.

Obtaining a modern and flexible military instrument requires a balanced development of its main components, mainly the essential ones: land forces, air forces, maritime forces and special operations forces.

The vertical dimension of the modern confrontation and the impact brought by the optimal engagement of the modern air forces pointed out the importance of the air power in the economy of the whole conflict, underlining the necessity and usefulness to develop this component of the armed forces.

Consequently, the level of actuality and the potential of the air forces are defining elements of the military capability and has to represent a priority of any state aiming to consolidate its national security.¹

The state's ability to preserve the sovereignty of its air space or to obtain the air superiority or supremacy, in certain circumstances, proved to be an essential precondition for its ability to conduct military operations of any kind.

For this reason, the structure of the air forces has to be based on a balanced development of all the categories of forces and assets from its composition, a fact that will facilitate the application with maximum efficiency of the features and advantages given by this category of forces.²

Inside the air forces and, in general, in the broader context of the armed forces of a state or international actor, the ground-based air defense forces and, in particular, the surface-to-air missile ones, provides a unique set of attributes which contributes consistently to the consolidation of the air defense efforts.

At the global scale, the surface-to-air missile systems enjoys a special attention and are the subjects of some very complex development programs in the pursuit of their continuous update and improvement.

The need to develop and update the modern surface-to-air missile systems is fueled by the continuous evolution of the air threats and the constantly improving capabilities, supported by the current technological progress.

The entire range of air threat categories has evolved in the direction of increasing performance aiming, in many cases, the development of those features allowing them to penetrate the air defense system. These tendencies, supported by consistent development programs, can be noticed at all modern air threats, from combat aircrafts to unmanned aerial vehicles (UAV). Among them, the cruise missiles and UAVs offer a particular case, fully and directly supported by the technological progress, the growing popularity and the increasing access to these technologies.

As a result, concerned by the current evolution of the international security environment, more states manifested their interest to develop or acquire powerful and modern surface-to-air missile systems, in an effort to consolidate their air defense architecture, by the addition of new ones or the replacement of the outdated systems.

MEADS³ medium range surface-to-air missile system proposes such an alternative, providing a modern weapon system, capable to answer to a wide spectrum of operational requirements and offering sufficient flexibility in order to allow further adaption to any present and future challenges.

MEADS has been designed and developed to counter the whole range of air threats displayed by the contemporary battle space: tactical ballistic missiles, cruise missiles and modern combat aircrafts – manned or unmanned, ensuring capabilities for circular target detection and engagement.

The system has been developed by MEADS International, a company located in Orlando, United States, representing the joint venture of three big producers of military

¹ Strâmbeanu Victor, *The air power in the paradigm of national and global security*, Army's technical-editorial center Publishing house, Bucharest, 2006, p. 49.

² *Romanian Military's JOINT operations doctrine*, Bucharest, 2014, art. 0139.

³ MEADS – *Medium Extended Air Defense System*.

equipment: MBDA Italy, MBDA Germany and Lockheed Martin. This initiative appeared from the need of the three respective countries to consolidate their ground-based air defenses, by providing a feasible solution for the replacement of the older surface-to-air missile systems from the inventory of their armies.

In the particular case of Germany and United States, the development of this system aimed to replace the aging PATRIOT systems from their inventory, which were reaching the limit of their operational resources and displayed some operational limitations and shortcomings, very difficult to overcome despite all the transformations and updates applied to them.

Basically, the entire design and development of MEADS aimed, on one side, to remove the limitations of the currently deployed missile systems and, on the other side, to implement those technological solutions allowing it to answer to the actual requirements of the ground-based air defense, in particular, the need of integration and interoperability with the other air defense systems and structures.

The system features a high degree of maneuverability which allows the continuous air and missile defense of the forces on the move. Additionally, MEADS is able to ensure or participate at the area defense, the air defense of the national territory or the strengthened air defense of the punctual highly important objectives.

Being one of the most modern surface-to-air missile systems of the moment, MEADS offers a superior combat range, high mobility and interoperability with the majority of the current air defense systems, which gives him a superior capacity to protect forces and assets in critical areas around the world.

Short history of the system's evolution

The initial development agreement was signed in 1999, but the program suffered successive delays and the final contract was eventually signed in 2005, for an initial value of 3,4 billion USD. The design and initial development of the system were financed mostly by the United States, contributing with almost 58% of the costs and by Germany and Italy, for the remaining 35%, respectively 17% of the expenses, as part of a partnership program called NATO Medium Extended Air Defense System Management Organization (NAMEADSMO).⁴

In 2010, after finishing a study aimed at identifying the best candidate, the German Ministry of Defense identified MEADS as the most feasible option to be used for the consolidation of Germany's anti-missile system and as the possible future contribution of this country to EPAA⁵, the NATO's initiative to defend the European territories and populations against missile threats.

The development program continued with a test in 2010, during which MEADS BMC4I⁶ proved its interoperability with NATO's Air Command and Control System, using the ALTBMD⁷ system's architecture, under development at that time.

In February 2011, the US Department of Defense declared its commitment to finalize the design and development of the systems but made it clear US will not continue with the acquisition and deployment of MEADS due to budgetary considerations.⁸

During the same year, a series of tests proved the capacity of MEADS's Operation Center to control the multifunctional radar station (MFCR⁹), demonstrating the „*plug-and-fight*” capability of thin system. Subsequently, also in 2011, at White Sands Missile Range,

⁴ https://www.armyrecognition.com/united_states_american_missile_system_vehicle_uk/meads_medium_extended_air_defense_missile_systems_technical_data_sheet_specifications_pictures.html consulted on 03.01.2019.

⁵ EPAA - *European Phased Adaptive Approach*.

⁶ BMC4I - *Battle Management Command, Control, Communications, Computers and Intelligence*.

⁷ ALTBMD - *Active Layered Theatre Ballistic Missile Defence*.

⁸ http://www.acq.osd.mil/docs/U.S._MEADS_Decision_Fact_Sheet_Feb_11_2011.pdf consulted on 02.02.2019, 16.30.

⁹ MFCR - Multifunction Fire Control Radar.

MEADS conducted a demonstrative interception of a target attacking from behind, in a successful display of its 360⁰ capability.

One year later, in November 2012, at the same firing range, the system intercepted and destroyed an air target, using a configuration which included a network connected MEADS TOC¹⁰, a launcher armed with PAC-3 MSE interceptors and a MFCR which followed and successfully guided a missile against an MQM-107 target.

Some other features of the system were tested and proven in 2013, culminating with an interception test against two targets, all finalized with results exceeding expectations. In June of the same year, during six days of testing, MEADS proved again its interoperability with NATO systems, by using Link 16 connections, during Joint Project Optic Windmill (JPOW) exercises. Few months later, the system intercepted and destroyed two targets attacking simultaneously from opposite directions. With this occasion the entire system's functionality was tested and all the major MEADS components were verified: the 360⁰ surveillance radar, the battle management system, PAC-3 MSE missile launchers and the 360⁰ MFCR radar.

In July 2014, the system successfully concluded a complete demonstration of its capabilities at Pratica di Mare Air Force Base, Italy. The tests were conducted by German and Italian personnel and proved MEADS capacity to integrate into a large architecture and to maintain its fighting ability after losing any of the system's components. With this occasion MEADS proved again its ability to exchange messages in NATO formats, being connected with the German and Italian air defense systems, locate far away from the tested system.¹¹

MEADS was one of the candidates of the Wisla Polish program, concerning the acquisition of a medium range surface-to-air system, but was eliminated in June 2014, being surpassed by PATRIOT and SAMP/T systems.

On June 9th, 2015, German ministry of defense announced that Germany selected MEADS as the foundation for the program which will contribute to the consolidation of the country's air defense system. The name of the German variant is Taktisches Luftverteidigungssystem, for short TVLS and is designed starting from MEADS layout with the intent to replace the German PATRIOT systems.¹²

The composition of MEADS surface-to-air missile system

According to the standard design, the main elements forming MEADS are: long range UHF surveillance radar, the X band multifunctional fire control radar (MCFR), the tactical operations center (TOC) for the battle management, command, control, communication, computers and information (BMC4I), the launching stations and the PAC-3 MSE interceptors.

Additionally, the variant developed after negotiations and implementation of the operational requirements formulated by Germany, the TLVS missile system, will benefit from another medium range 360⁰ designed to work with the IRIS-T SL launchers and missiles, also integrated into the initial design of MEADS, which will serve as a second interceptor for this system. This option was added at Germany's special demand and is destined to counter the air threats which do not require direct hit and represents a cheaper alternative to the main interceptor PAC-3 MSE.

The long-range surveillance radar was designed to perform surveillance and research of the air space and is based on an actively scanned array antenna, with digital beam formation. This technology allows very good performance for the detection of small sized targets, ensures a 360⁰ coverage and provides data for the formation of the local aerial picture.

¹⁰ TOC – *Tactical Operations Center*.

¹¹ <https://www.army-technology.com/projects/meads/> consulted on 03.02.2019, 13.00.

¹² <https://news.lockheedmartin.com/news-releases> consulted on 04.02.2019, 15.00.

This radar is designed to discover the future air threats such as ballistic missiles, cruise missiles and manned and unmanned air vehicles.

The multifunctional fire control radar (MFCR) provides 360⁰ coverage and is responsible for target detection, tracking, classification and identification down to air platform level. Additionally, the MFCR uses a phased array antenna to guide the interceptor PAC-3 MSE to the target.

Both stations, surveillance and MFCR radars, are equipped with Mode 5 IFF systems capable of identifying the friendly aircraft among the discovered aircrafts, thus contributing to the avoidance of friendly fire incidents.

The battle management system BMC4I represents the command and control center of the entire MEADS surface-to-air missile system. All the processes and functions needed to ensure the system operation are managed by this battle management center, including target engagement, mission planning and combat support.

This element is also responsible for the administration of system states and the coordination of combat teams training programs.

The software applications implemented into BMC4I are used at all command levels and provide a high degree of flexibility by allowing the integration of standardized interfaces and facilitating data exchange with allies and partners around the world.

MEADS uses an autonomous communication system which is the foundation of its flexible, netted distributed and scalable architecture. This system manages the entire range of connections needed by MEADS, long and short range, wired and wireless links, and ensures the application and implementation of effective mechanisms for secure data and communication exchanges. Using this system, MEADS is able to establish high stability wired and radio connections, allowing an increased transfer capacity for real time data flows, to and from all the internal and external users.

As mentioned before, the German variant, TLVS, will integrate an additional medium range radar, used as a research and guidance radar for IRIS-T SL missiles.

The unique combination of radars used by TLVS will be completed by an optronic sensor which will add the capacity to visually identify the target. This sensor is integrated in order to preserve the system's combat readiness in dense electromagnetic combat environments, where the radar function will be severely degraded.

Like all the other missile systems from its class, MEADS was designed to fight in a centralized manner, being easily integrated within most of the complex command and control architectures. As a consequence, the system may initiate engagements using target data provided by external sources, by directly connecting to networks which integrate allied reconnaissance and intelligence sources located at considerable distance.¹³

The system's main interceptor is the PAC-3 MSE missile, one of the most advanced surface-to-air missiles of the moment, also used by PATRIOT surface-to-air system. As mentioned before, this missile has been optimized to counter tactical ballistic missiles, with an integrated "hit-to-kill" capability developed to nullify or minimize the effects produced on the ground by the interception of mass destruction combat loads. Compared with the previous version, PAC-3 MSE missile incorporates numerous technological innovations, both hardware and software, providing improved interception features against all the current air threats and leaving enough space for the future growth of its possibilities.

PAC-3 MSE was flight tested for the first time in 2008 and by 2018 it reached the initial operational capability. The missile was selected to be used as the main interceptor for MEADS since 2006, while it was still under development.¹⁴

¹³ TLVS - *Taktisches LuftVerteidigungsSystem*, Presentare MEADS International, 2018.

¹⁴ http://www.deagel.com/Defensive-Weapons/Patriot-PAC-3-MSE_a001152004.aspx consulted on 06.02.2019, 17.00.

The missile segment enhancement (MSE¹⁵) is mainly based on an improved propeller for the missile, in this case, a dual-pulse solid rocket motor, developed by Aerojet Rocketdyne, larger than the one used for PAC-3. Also, as part of this update, the same company developed and implemented a “Lethality Enhancer” (LE), consisting of a small explosive combat charge which launches a flow of splinters toward the target, improving the missile’s kill probability against specific target types.

In this configuration the interceptor flies with a top speed of 5 Mach and offers an increased reach in distance and height, considerably superior to the ones provided by the previous version, the PAC-3 missile.¹⁶

Like in the case of the PATRIOT systems, the missiles are placed in containers mounted on mobile launching stations which can carry up to 8 PAC-3 MSE missile. The launch order is transmitted from the battle management station only to the selected launcher and the missiles are launched under a height angle of 70°.¹⁷

As mentioned before, in the particular case of TLVS systems, a second interceptor will be used, IRIS-T SL, intended to counter any aerial target not requiring a direct hit, meaning that the use of PAC-3 MSE interceptors is not needed. This type of missile was developed by Diehl BGT Defense, to answer the needs of German Air Force, as an easy to integrate solution for the consolidation of the current and future air defense systems.

IRIS-T SL is an advanced variant of the air-to-air IRIS-T missile, operational since 2005, developed under German led to replace the aging AIM-9 Sidewinder missiles.

In its surface launched variant, the missile was designed to counter the entire range of combat aircrafts, helicopters, cruise missiles, guided munitions, air-to-ground missiles, anti-ship missiles, antiradiation missiles and unmanned aerial vehicles.

The IRIS-T SL project development was initiated starting with 2007, following a contract attributed to Diehl BGT Defense by the Federal Office of Equipment, Information Technology and Utilization of the Bundeswehr (BAAINBw). The development of the interceptor and the associated launching station continued with the update of the missile sections by implementing new software applications to manage the data links, a complete redesign of the missile control system, infrared sensor improvement, etc.

The first flight test was successfully concluded in 2009 and was followed by successive test for the verification of the other missile components, in 2011 and 2012.

The testing continued with successive fire tests in 2012, 2013 and 2014, usually simulating the interception of several target types, all ended with very good results.

The final result of this development program is a vertically launched compact missile, capable of high maneuverability and agility against the entire range of threats mentioned above. The missile is propelled by a solid rocket motor, augmented by a vectorized control system, which provides actions ranges of almost 40 km and heights of up to 20 km.

Regarding the navigation systems, the missile incorporates a global positioning system, an inertial system, for autonomous navigation, and an infrared passive sensor, ensuring the missile guidance, increased stability against electronic counter-measures and providing a superior precision of target intercept. Additionally, the missile uses a radio link to connect to the dedicated radar station on the ground, for additional guidance and data concerning the target.¹⁸

The MEADS/TLVS system is advertised as one of the most modern and flexible medium range surface-to-air missile systems of the moment.

¹⁵ MSE – *Missile Segment Enhancement*.

¹⁶ <http://www.rocket.com/patriot-pac-3-mse> consulted on 08.02.2019, 18.00

¹⁷ https://www.armyrecognition.com/united_states_american_missile_system_vehicle_uk/meads_medium_extended_air_defense_missile_systems_technical_data_sheet_specifications_pictures.html, consulted on 09.02.2019, 17.00.

¹⁸ <https://www.airforce-technology.com/projects/iris-t-sl-surface-to-air-guided-missile/> consulted on 12.02.2019, 15.00.

Even though there are no clear technical details, available from open sources, concerning the technical data of this missile system, it is promoted and assessed as one of the most powerful SAM systems of the moment in the world.

Among the most appreciated features of MEADS we can mention the netted-distributed capability and the “plug-and-fight” open architecture, which confers the potential to react flexibly to any operational needs. Also, the system’s organization around the “task force” concept ensures an increased ability to quickly adapt and provide an optimal answer against new threats, by building mission tailored force structures.

The opened, network centered architecture allows any combination of sensors and launchers into a single, centralized air and missile defense system. Basically, from a tactical level command center a commander can add and extract elements to/from the system, depending on the situation, without interrupting or impeding its ability to accomplish the mission.

Concerning its mobility, the light and compact design, efficiently organized around Major End Items (MEI) concept, contributes to the tactical and strategic transportability of this missile system. Besides the capability of being transportable by C-130/A400M aircrafts, MEADS missile system has a very good cross-country ability, making it capable of answering mission requirements related to this feature (deployment/redeployment).

MEADS offers superior fire power and hit-to-kill technology validated through numerous tests, 360⁰ radar coverage and networked battle management architecture. The very aim of developing all these features was to replace the existing PATRIOT surface-to-air missile systems belonging to US Army and Germany.

MEADS met all the requirements demanded by Germany for its future ground-based air defense system and was selected as a baseline for the development of its future surface-to-air missile system, called TLVS.

One of the main demands was the capacity of one single system to provide circular air defense, for 360⁰, when defending a point or even an entire area. As presented before, all the radar stations belonging to this system are capable of surveillance, research, tracking, identification and, respectively, engagement of threats approaching from any direction.

MEADS is also recommended by its high survivability and sustainability due to several directly related features such as: cross-country mobility, capacity of dispersing the system’s elements, resistance to electronic countermeasures, advanced integrated diagnosis functions, increased capacity to transport maintenance and support materials, etc.

Some of the features mentioned above contribute to a consistent decrease of operational and support costs, augmented by the revolutionary logistic concept and the increased reliability of the system’s components, substantially reducing the need for maintenance and associated costs.

Moreover, by its capacity to provide all-around defense (360⁰), due to its powerful and complex radar stations, MEADS covers an area of up to 8 time bigger than the one provided by other missile systems of this class, using fewer installations and reducing considerably the need for personnel and equipment.

Another highly appreciated feature of MEADS missile system is its capacity to integrate and interconnect with other weapon systems and command and control (C2) networks. The flexibility of the implemented communication systems allows an easy information exchange through external data link to and from airborne C3¹⁹ systems, ACCS, AEGIS, THAAD and PATRIOT.

This interoperability capability has been proven during the numerous tests, under various conditions and in increasingly complex formats, is based on the above-mentioned

¹⁹ C3 – *Command, Control and Communications*.

functions and features and proves that MEADS is one of the systems with the highest operational flexibility from this class of weapons.

Despite all these proven features and performance, demonstrated in tests and exercises starting with 2010, MEADS future is still questionable since the prospect of turning it into an operational reality seems far away.

The hardest blow in this respect was delivered with the US Department of Defense decision to withdraw from this program after the conclusion of the design and development phases (D&D²⁰), despite the fact that US contributed with the biggest part of the 4 billion dollars invested in this project. This decision was determined by the numerous delays appeared during the development process, with the associated and substantial costs increase of the entire project. As a consequence, while the initial completion term was estimated as 2007, the subsequent evolution and difficulties encountered during development pushed it further and further, and the reality is that, up to date, there is no MEADS system delivered as part of a production contract.

Under these circumstances, Germany's resolute decision in favor of this missile system, as the baseline for its future air and missile defense system, came as a considerable surprise and as a breath of fresh air for this project. This preference was expressed since 2010 and was consolidated with the subsequent decision of 2015, which indicated MEADS as the preferred candidate for future development and integration into Germany's air defense architecture.

What is certain for this entire dilemma is the fact that MEADS, developed from the very beginning to replace the deployed PATRIOT systems and focused on eliminating their operational limitations, found itself in front of a powerful competitor, determined and capable to fight, with all available weapons, to remain relevant in this game.

In this competition, PATRIOT used its privileged position, given by an entire operational history which recommends it as one of the most powerful missile systems of the moment and the only one, in this class, combat proven. This position is consolidated by the fact that it is the most popular and internationally spread missile system of the moment.

Starting from these very favorable premises, Raytheon has been constantly few steps ahead MEADS International and succeeded to win important competitions like that for US Army or the one related to the Polish Wisla program.

These examples, while contradicting the primacy of operational requirements, underline the fact that the economic reasoning may prevail in front of the operational one, due to the considerable costs associated with the development and acquisition of this type of weapon systems.

Despite the apparently adamant public positions and decisions, the competition between the two systems remains open, in relation with the Wisla program, but also with the German initiative to upgrade its air defense system, both Raytheon and MEADS International launching tempting counter-offers, based on arguments highlighting the individual advantages of each system they promote.²¹

Beside these considerations concerning the competition between the two missile systems, we have to accept the fact that PATRIOT, due to its popularity, has been produced in large numbers and deployed by 13 countries worldwide, while MEADS, despite all promises and proven capabilities, remains an uncertain project, depending mostly on Germany's decision to produce TLVS.

After almost 4 years of debates and negotiations surrounding the MEADS project, there is a chance that 2019 will bring a firm decision in this regard and will take it out of this uncertainty or, on the contrary, will bring an end to this system who promises so much.

²⁰ D&D – *Design and Development*.

²¹ <https://web.archive.org/web/20170202215618/http://meads-amd.com/meads-international-provides-updated-offer-for-polish-wisla-program/> consulted on 16.02.2019, orele 18.30

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EMERGING THREATS FOR THE AIR DEFENSE SYSTEMS – UNMANNED AIR VEHICLES

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Abstract:

The range of air threats has grown considerably with the addition of unmanned air vehicles. The complexity and diversity of this new category of threats provides a very large array of options and capabilities available at affordable costs and efforts. The increasing use of these capabilities during some modern military conflicts, especially the ongoing ones, indicates an increasing proliferation trend of this type of aerial platforms. This reality launches new challenges, especially in the future, for the air defense, in general, and for the ground-based air-defense, in particular, due to the special features of the unmanned air vehicles.

Keywords: *unmanned air vehicles; air threats; air defense systems; ground based air defense; surface-to-air missile systems.*

The contemporary technological progress has marked, in a radical manner, the aerospace domain, in all its aspects. The numerous innovations and the progress allowed the continuous improvement of the means operating in this environment, but also the emergence and diversification of new categories of systems.

The interest for the development of unmanned air platforms can be tracked back to the pioneering period of the aviation and is linked to the limitations brought by the onboard human presence of the aerial platforms.

Despite realizing the usefulness and advantages inherent to such an option, obtaining an unmanned air platform proved to be very difficult, if not even impossible, for a long period of time, due to the scientific limitations, the level of technology being unable to sustain such advanced concepts for the respective periods.

The current technological progress, fueled by the explosion in the communication and information domains, is the one that has given a new impetus to this idea, leading to a spectacular grow, towards a broad diversity of forms and design solutions.

The growing popularity of UAV has been fed by their increasing and broader use to fulfill several types of mission, in the context provided by the conflicts in Iraq and Afghanistan, due to the extensive media coverage, specific to these military confrontations. At the same time, the enlargement of the range of missions performed by these air means, starting with their arming and proven ability to deliver fire power against land targets, opened new perspectives, illustrating the versatility and flexibility of the solutions they may offer.

Defining the unmanned air vehicles/systems

Although the dedicated literature abounds in descriptions and explanations concerning the unmanned air vehicles, most of them reflecting different stages of their technological

evolution or the diversity of variants and building solutions, there is no unitary approach regarding a definition of UAV.

The Britannica Encyclopedia brings the following clarification regarding this concept ‘*Unmanned aerial vehicle (UAV), is a military aircraft that is guided autonomously, by remote control, or both and that carries sensors, target designators, offensive ordnance, or electronic transmitters designed to interfere with or destroy enemy targets.*’¹

In a more comprehensive approach, the unmanned aid vehicles (UAV), commonly known as drones, but also as aerial robots, unmanned aerial means or unmanned air systems (UAS), represent those aerial platforms, without an onboard human operator, which use the aerodynamic forces for lifting, can fly autonomously or can be piloted from the ground, may or may not be recovered and which may carry a lethal charge (UCAV²) or not (URAV³).⁴

Currently, there is a tendency to use the term UA⁵, to identify just the air platform within the broader context offered by the UAS concept, which identifies an entire functional system by the addition of the other elements that facilitate the coordinated flight of the aerial platform.⁶ A minimal UAS design includes at least the following elements: the unmanned aircraft (UA), the command and control (C2) data link and the ground control station. In reality, a UAS may be a lot more complex and may include, besides the essential elements presented before, a multitude of other components, depending on the mission and specific tasks assigned to the system.

In the military field, UAV are used for reconnaissance or battlefield surveillance missions, but they may also interfere in the operations at the tactical level, either indirectly, by indicating targets for the precision guided munitions aboard manned combat aircrafts, or directly, by using its own onboard armament (wherever the case).

The success enjoyed by this technology resides from the inherent comparison with the manned combat aircrafts. Thus, we can identify at least some domains where UAV are superior to manned aircrafts.

Firstly, the use of UAV is not enclosed by the physical and psychological limitations, heavily tested in the case of combat aircraft pilots, especially the supersonic ones, like the majority of modern manned combat aircrafts. The UAV are more resilient to the environmental conditions, can fly longer periods and are able to execute simultaneously a bigger number of tasks. All these limits are technologically driven and are subject to constant improvement while the human limitations are not so easy to surpass and, eventually, we need to resort to technological means to increase these limits.

At the same time, in close connection with the previous idea, in areas involving high risk, UAV can significantly contribute to reducing human loss, an important consideration in all air operations.

The cost linked to training and preparation are considerably lower for UAV and is reduced to the expenses associated with the operators’ training, mostly taking place in simulators and thus eliminating considerable efforts related to pilots’ training, or those determined by fuel consumption, spare parts and combat aircraft maintenance. Such an advantage is amplified by the fact that, for UAV, the human resources necessary is

¹ <https://www.britannica.com/technology/military-aircraft/Unmanned-aerial-vehicles-UAVs#ref57529> consulted on 05.01.2019, 15.30.

² UCAV – *Unmanned Combat Aerial Vehicle*.

³ URAV – *Unmanned Reconnaissance Aerial Vehicle*.

⁴ Laurențiu Popescu, *Sisteme aeriene fără pilot uman la bord*, Editura Universității Naționale de Apărare, București, 2012, p. 42.

⁵ UA – *Unmanned Aircraft*.

⁶ JDP-0-30.2 *Unmanned Aircraft Systems*, 2017, p. 12.

considerably lower, a single UAV operator being able to control several UAV, especially for the systems with a higher autonomy degree.

Short history of the evolution of unmanned aerial vehicles

Since the history of UAV is somehow at the confluence of several major technological concepts, such as aviation and missiles, it can be linked both to the evolution of the interwar manned aircraft and with the use of the first missiles by Germany, during the Second World War.

Among the first known UAV were the remote piloted vehicles (RPV⁷) or drones, small radio-controlled aircraft, used during the Second World War and afterwards as targets for combat aircrafts or the anti-aircraft guns. These could fall within two categories: small seized, cheap and impossible to recover, usually used for training, and bigger and more sophisticated systems that could be recovered by means of radio-controlled landing or by parachute. They were usually equipped with reflective devices to simulate the radar signature of the enemy aircraft and were later used as decoy to support the bombers entering enemy defensive systems.

Once the potential of these devices in accomplishing the photographic and electronic recognition was understood, the first drones were designed for this particular purpose. One example is the AQM-34 Firebee, produced in several versions by Ryan Aeronautical Company and obtained by modifying an American drone used as target. It flew for the first time in 1962 and was intensely used during the Vietnam War and later, for surveillance missions over North Korea and China.

During the conflicts of the time these systems were able to penetrate very dense defense systems using only the advantage given by the small size and managing to supply highly accurate and valuable information. The area of options provided by this early UAVs was highly diminished by the technological limitations of the 1960's and especially by those resulting from the use of roll film cameras and primitive launching and recovery systems.

Due to the limitations and lack of technological maturity, the real benefits of using UAV were unattainable for a long period of time. Starting with the 1980's, in the context of miniaturizing avionics and perfecting sensors and precision guided ammunition, the capabilities offered by the UAV systems witnessed a spectacular improvement.

One of the technical solutions of critical importance was the development of small sized and high-resolution cameras placed in the UAV's turret, under the fuselage, remotely controlled by using secured data link.

Equally important, within the context of the UAV evolution, was the development of laser projectors to indicate the target and especially the employment GPS technology which allows the determination of accurate locations, both for the UAV and for the ammunition onboard.

By using such technology, the United States of America developed UAVs with strategic range, using satellite communication to transmit control signals and to receive the information acquired by the onboard sensors.

The first series of RQ-4 Global Hawk was produced in 2003 and transformed this domain by the flexible design and the capabilities it offered. This UAV is able to transport a wide variety of optical and infrared sensors and radars, to take off or land on a highway and to fly at heights of about 20 km. The system proved its effectiveness during the conflicts in Afghanistan (2002) and Iraq (2003) and continues to be the most important strategic UAV in service nowadays.

The UAV classification

Dedicated literature and other open resources provide an entire array of classifications, based on a large set of criteria and starting from different approaches. All these can only

⁷ RPV – *Remotely Piloted Vehicle*.

emphasize the diversity of unmanned aircraft systems and the complexity of this constantly broadening technological domain.

First of all, using an elementary approach, we can divide the UAV systems into two main categories: military and civilian, by separating the systems used to accomplish military missions from those destined to accomplish tasks without any connection with the military domain.

Moreover, in very general terms, a classification realized by UVS⁸ International, divides the unmanned aerial vehicles into three main categories: tactical UAV, strategic UAV and special purpose UAV.

In the same spirit, the work „Unmanned aerial systems”, reunites some of the most popular criteria used to classify UAVs, based on the analysis of a broad range of papers and bibliographical resources. Among the proposed criteria, it is worth mentioning the following: mission to accomplish, action range, take off method, size, flying height, method of use, flying autonomy, propulsion system, type of control system etc.⁹

In this regard, we have to give credit to the Romanian Civil Aviation Authority for the constant efforts to define, classify and regulate the UAV domain in our country, by updating the Regulations of the Romanian Civil Aviation Authority RACR-AZAC ‘Flight acceptance for certain civil aircraft categories’.¹⁰

NATO also proposes several UAV classifications, in an effort to regulate this domain, through the activity of various operational working groups, whose output eventually combines various relevant above mentioned criteria.

One of these classifications was proposed in A.J.P.-3.3.(b) Allied Joint Doctrine for Air and Space Operations. This is a complex classification by the successive application of several criteria. The first criterion is that of the aerial platform weight which divides them into three different categories: Class III - UAV weighing more than 600 kg; Class II - UAV weighing between 150 kg and 600 kg and Class I - comprising UAVs lighter than 150 kg. Next, listed as heads of different columns, the classification applies some other criteria: Category, Level of engagement, Operating altitude, Action range and supported commander. The final result is a rather complex classification which covers most of the UAV used currently for military purposes.

Specific features and capabilities provided by UAV

The vast diversity of UAV systems is mainly due to the fact that they were developed to respond to various needs. Therefore, as one can see in the variety of existing solutions, they come with a wide range of features and capabilities, differentiating and recommending them for specific needs, such as the action range, the flying height and speed, the ability to transport certain amounts of payload and the type of payload they may carry, etc.

Most of currently used UAV were designed to execute assignments within the ISR domain¹¹, being built to transport a variety of sensors and communication equipment. For this purpose, if bigger UAV systems are destined to longer distance remote surveillance and for longer periods, smaller UAV were designed for easy deployment, but shorter action range. It is this very operational requirement that represents the starting point for a diversity of building options covering the entire distance range, from a few tens of meters to a few thousand kilometers.

⁸ UVS – *Unmanned Vehicle Systems*.

⁹ Laurențiu Popescu, *Sisteme aeriene fără pilot uman la bord*, Editura Universității Naționale de Apărare, București, 2012, pp. 63-66.

¹⁰ <http://www.caa.ro/page/rpasuavdrone> consulted on 07.01.2019, 14.00.

¹¹ ISR – *Intelligence, Surveillance and Reconnaissance*.

The same diversity can be identified when it comes to the transport capacity of payload, in direct connection with the system's destination. Within the current trend of using UAS for direct attack missions, we can expect an increase of the transport capacity. In this direction, we can assess the fact that this type of aerial platforms can constitute an efficient vector to transport loads of mass destruction, and for certain types of WMD¹², it probably represents the most efficient method of delivery.¹³

In the medium and long term, we can estimate that UAV systems will evolve towards smaller sizes, a need originating from the current operational requirement. This process is facilitated by the technological progress taking place in all areas and having a direct impact on the platform size, starting with the performances of the propulsion systems and ending with the minimization and improvement of the combat payloads.

One of the most obvious directions of developing UAV is toward an increasing autonomy. Despite numerous controversies, with profound moral implications, UAV systems will become more and more autonomous, based on the exponential increase of data processing ability given by the computing systems integrated within the UAVs, that gradually grow more flexible and powerful. An autonomous system involves a superior level of understanding of its mission and environment, as it is able to choose a certain course of action among several alternatives.

Obtaining a certain degree of autonomy is conditioned by some of the defining features of UAS. Thus, one of the most important demands is the capacity of the aerial platform to permanently determine its position in space, with sufficient precision and stability. A convenient solution is offered by the GPS, augmented by additional sensors and systems used to enhance the precision, safety and stability of the navigation system.

The previously mentioned demand concerning navigation is completed by the UA capacity to produce guidance commands that are precise enough as to allow the platform's navigation on a chosen flight path.

Another important demand concerns the ability of the unmanned aerial platform to avoid certain obstacles appeared during the flight. This is currently a very researched field and one which witnessed remarkable progress. One of the solutions to this problem is the use of sensors on the exterior surface of the UA, which are able to detect the approaching objects and generate electric signals subsequently processed and transformed into proper guidance commands.

The UAS autonomy is also measured by its capacity to identify certain problems occurring during operation, which can affect the functionality of vital subsystems during real time missions.

Additionally, an autonomous system must be able to readjust its trajectory based on certain algorithms for flight planning. The implementation of this requirement demands a high processing capacity, as flight planning requires an increased volume of information referring to the UA flying environment. The data regarding the environment is the basis for computing the best route or its reconfiguration, if the need arises.¹⁴

Among the features and functions already deployed within current UAVs, we can identify the flying faults management, mission management, engagement in cooperation, data fusion and automatic target identification and engagement.¹⁵

¹² WMD – *Weapons of Mass Destruction*.

¹³ Jeffrey, Renehan, *Unmanned Aerial Vehicles and Weapons of Mass Destruction A Lethal Combination?*, Air University Press, Maxwell, Alabama, USA, 1997, p. 41.

¹⁴ Suraj G. Gupta, Mangesh M. Ghonge, Dr. P. M. Jawandhiya, *Review of Unmanned Aircraft System (UAS)*, International Journal of Advanced Research in Computer Engineering&Technology (IJARCET), Volume 2, Issue 4, April 2013, p. 1651.

¹⁵ Wang Jong Chin, Victor Chua Yung Sern, *Unmanned Aerial Vehicle Development Trends & Technology Forecast*, p. 28.

At present, and most certainly within the future, UAV or UCAV advanced systems will be completely integrated in complex combat networks, will fight along manned aerial platforms and will be able to act upon missions and information received from various sources and sensors, also belonging or being integrated into these networks.

The combat load transported by the UAV/UCAV systems witnessed a continuous diversification and improvement. The sensors reached new limits regarding the quality and accuracy of the information they provided and their action ranges, while ammunitions become more intelligent, precise and powerful. It is estimated that, within a ten years period, UAV will be armed with revolutionary weapon systems, from the category of direct energy weapons (DEW), highly efficient against command and control (C2) and communication systems.

Compared to other weapon systems, due to their inherent features, such as very low flight altitude and small radar signature, UAV provides superior survival ability. Nowadays, the general technological evolution allows a permanent enhancement of this requirement, by adding and adapting the new innovations in the field. During the last few years, remarkable progress was witnessed on implementing stealth technology within advanced UAV/UCAV systems. For this purpose, actions were taken to adjust the propulsion, to adopt internal weapon bays, to use composite materials, to reduce size and improve surface by using radio-absorbent materials and stealth geometry.

Considerations on development trends and the impact of UAV

The experience of the last 50 years and numerous conflicts, of different nature and intensity, witnessing the increasing use of UAV, proved that these new weapon systems can play an efficient and versatile role in both offensive and defensive military operations.

The use of such systems in the Iraq and Afghanistan transformed the UAV into a weapon that can contribute decisively to the outcome of a military operation, regardless of its nature, typology or stage of development.

Today, UAV represent an important technological tool, a significant piece of the arsenal of any modern army, accomplishing a wide variety of functions, ranging from surveillance to attack.

Although the utility of such systems in the military area was proven a long ago, the changes to the international environment that witnessed the fall of the Soviet Union, the return of religious terrorism and the increasingly wider availability of advanced technology, arise more issues concerning the means and ways of controlling and countering this new type of air threat.

The availability of UAV systems for potential attackers is mainly based on the wider availability of these systems for legitimate users, belonging to the military or the civilian areas, which unwillingly contribute to the spread of such technology toward less legitimate ones.

At the same time, the attractiveness of such systems is increased by the fact that the UAV can offer a reasonable air offensive capability that can be attained and developed at lower costs and with less effort than in the case of traditional air combat systems, such as manned combat aircraft or ballistic missile systems. Actually, many of the benefits of this category of systems derive exactly from the advantages emphasized by the comparison of UAS with other offensive combat air means.

If for a long period of time the high costs and lack of technological maturity represented a considerable limitation which prevented the access of many states and other international actors to advanced weapon systems, the current progress and the wide proliferation of accessible technical solutions completely changed the whole picture, offering terrifying perspectives.

All estimations indicate a constant growth of the market, leading to continuous development of these capabilities, while the solutions for the control of this ample proliferation phenomenon prove to be rather weak, at least up to this date.

Part of this evolution, constantly feeding and amplifying it, more countries have initiated development programs for the UAV systems. Alongside with the main manufactures in the United States, Europe and Israel, countries like China, India, Pakistan, Iran, Japan, Syria and Australia massively invest in developing more advanced and powerful systems.

With the developing market, fueled by the increasing interest in these types of systems, the number, diversity and capabilities they provide will continue to grow, the prices will be more and more competitive and their availability for both state and non-state actors will increase constantly. Although the main function of UAV is that of surveillance and recognition, gradually, but inevitably, their ability to provide other capabilities will improve, including that of delivering combat payloads to the target, a capability which has already been combat proven.

The higher availability of UAVs, accompanied by an improved versatility and increased capabilities started to generate concerns regarding the possibility of being used by potential enemies. As attack platforms, UAV may be used in a variety of operational scenarios and against a variety of targets.

Among the possible scenarios, recent information analyses indicate the possibility and the usefulness of using such systems against critical infrastructures, dense groups of people or to disperse non-conventional ammunition, in asymmetrical or hybrid scenarios.

In recent conflicts, non-state actors have been interested in using UAV with or as attack capabilities. It is the case of terrorist organizations like Hezbollah¹⁶ or Hamas¹⁷ in their fight against Israel. The same interest is proven by the intensification of the discussions regarding these capabilities, on terrorist internet sites.

As a conclusion, UAV systems represent a category of combat means in continuous evolution. The diversity, versatility and the capabilities they provide recommend them as a viable solution for the states/actors worldwide, especially those unable to allocate enough resources to obtain more powerful weapons systems such as classical means of air combat or ballistic missiles.

The biggest challenges for the individual surface-to-air missile systems or even for more complex missile defense architectures come from the emerging technologies brought by UAV. The inner features of these new technologies, amplified by the innovations coming from the area of combat aircraft or ballistic missiles, make them even more difficult to counter.

The possibility to attack from any direction, on very complex flight paths, with a high level of autonomy, using real time information and data, with increasing striking power and in conditions of pseudo-invisibility, transforms them into almost impossible targets for the air and missile defense systems.

The surface-to-air missiles systems are a vital part of the solution in fighting against this threat. Many of the innovations implemented in these defense systems are actually meant to adapt them to the new challenges of the contemporary air space, especially when it comes to the ability to counter the present and future air threats.

For this purpose, almost all the components of the missile systems went through radical changes, especially the key elements.

Thus, the radar stations of these systems provide remarkable performance, despite the fact that nowadays they integrate many more functions than used to do in the past. The modern missile systems use multifunctional radars, able to search, discover, recognize, track, identify and report targets. Due to the advanced technological solutions implemented, these radars are able to track a larger number of targets, can be hardly jammed and provide excellent discrimination abilities, allowing the discovery of targets with smaller radar signatures, in some cases even targets labeled as „stealth”.

¹⁶ <http://www.middleeasteye.net/news/analysis-hezbollah-enters-new-war-use-armed-drones-syria-11412100>, consulted on 16.01.2019, 10.33.

¹⁷ <https://www.nytimes.com/2014/07/15/world/middleeast/hamas-publishes-photo-of-a-drone-it-says-it-built.html>, consulted on 20.01.2019, 11.20..

Another vital element of the modern surface-to-air missile systems is the engagement control station (ECS¹⁸), usually collocated with the tactical control center. ECS represents the brain of the missile system which coordinates all the other elements, from the radar station to the missiles. The ECS enables the ability of a missile system to determine complex engagement solutions, to track and engage multiple targets with several missiles. This essential component is also responsible with the initiation, support and control of all the processes required to sustain the functionality of the entire missile system.

The engagement control station allows the system integration into the network and its ability to use the information provided by the complex data architectures. The ECS realizes the missile system's integration in C2 structures, facilitating coordinated air defense and providing optimized engagement solution with the contribution and implication of all the available structures, forces and means.

The missiles have also benefited from major modernization programs that changed them radically, for the very purpose of making them more capable to intercept the new types of threats, like the UAVs. Even if many of the features currently implemented into the modern surface-to-air missiles focus on fighting ballistic threats, there are also sub-systems and technical solutions meant to counter the entire range of threats in the contemporary and future air environment. Modern missiles are more agile, due to the improved propellers, fins and guidance systems, have higher flight speed and can undertake superior g-forces as compared to their predecessors, thus being a lot more efficient in countering highly maneuvering targets. The combat payloads, their initiation and directing mechanisms of the splinter flows were also updated to ensure a higher probability of target annihilation.

Countering UAV using surface-to-air missiles requires a rigorous analysis of the importance of such an approach in the economy of the entire operation, mainly due to the difference, most of the time a very substantial one, between the cost of a UAV and that of the missile used to destroy it. Nevertheless, the recent history gives us some examples where this kind of decision was taken and consequently some few hundred dollars UAVs were destroyed using many thousand times more expensive surface-to-air missile.¹⁹

Considering the above-mentioned ideas, despite the considerable efforts to improve the air defense forces and means, countering the UAV threat still raise numerous challenges. Among these, the most significant one is the ability to timely discover them, especially if we take into account the small and very small size UAVs, belonging to the mini or even micro-drone categories. Fortunately, at least at this moment, the action range of these systems is quite limited and requires the use of other platforms, a lot easier to detect, in order to launch them as close as possible to the area of interest.

For this reason, it is of utmost importance to integrate all the air defense forces and means into more complex architectures, thus bringing together several types of radars and sensors, and consequently increasing the chances to discover this kind of targets. Using the identification and location data provided in real time through the recognized air picture, the weapon systems, integrated within the same air defense architecture, are able to counter the threat using the most appropriate kinetic or non-kinetic effector.

The current modern surface-to-air systems may offer efficient solutions to fight against the UAV threats, but these capabilities are hardly attainable even for the most powerful nations due to the costs incurred to obtain, operate and constantly improve them. Nevertheless, the permanent update of missile defense systems must be a continuous concern for any state wishing to maintain a relevant capacity to defend the sovereignty of its national air space.

¹⁸ ECS – *Engagement Control Station*.

¹⁹ <https://www.jpost.com/Operation-Protective-Edge/Gaza-drone-downed-by-IAF-363280> consulted on 25.01.2019, 13.30.

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LEARNING FROM THE OTHERS: BUILDING A TEAM OF TEAMS

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Abstract:

*Starting from the assumption that nowadays, in all domains, English is used not only as a “vehicle” of communication, used for sending and receiving messages to and from our partners and allies, but also as an instrument of finding out interesting aspects and developing trends in the literature in the field, the present paper is meant as a book review on an interesting topic related to military leadership. The book is *Team of Teams. New Rules of Engagement for a Complex World*, written by US retired Army general Stanley McChristal, former commander of American troops in Iraq and Afghanistan. The year when it was published, which is quite recent – 2015 – and the impressive amount of stories told from the general’s personal experience – plus the affiliation of the retired general to the most prestigious institutions of higher education were all reasons for choosing this book to present our future leaders in hope of raising their interest in and curiosity for the concepts depicted and conclusions derived.*

Keywords: *leadership; team of teams; shared consciousness; empowered execution.*

1. Introduction

As an English teacher working in/for the military for almost twenty years, I have many times had the chance to discuss with the students or listen to their debates regarding military leadership, a possible model of the “perfect commander”, or the characteristic features – some innate, some learned and developed – that must be part of an officer’s list of qualities in order to make him/her a successful leader. There were lessons from textbooks, articles, documentaries and even movies I used as springboards for discussions and every time, no matter their level of studies or their level of English, I discovered that students were absolutely fascinated with this topic and found it one of the most interesting subjects of discussion and debate. So I decided to pursue this interest of theirs – and of mine, too – and find new sources and resources that may give some insight in the recent trends in this field of leadership.

Such a resource is the book called *Team of Teams. New Rules of Engagement for a Complex World*, written by General Stanley McChristal (US Army retired) with two former SEAL officers who were deployed in Iraq and Afghanistan: David Silverman and Chris Fussell, and a Yale and Cambridge graduate, Tatum Collins. As the main author of the book, retired general McChristal can still be found at Yale, teaching a seminar on leadership to graduate students, this made me think that his work would prove valuable insight to military MA students in search of good ideas for future leadership practice.

The book comprises episodes from the war in Iraq, but it is by no means a war story. Actually, it includes references to a lot of domains and aspects of present day life that seem to validate the conclusions drawn from the main author’s experience and expertise in military leadership matters. Understanding and accepting that today’s world is completely different from the world fifty years ago and even from the world twenty years ago is actually the only option to become successful as a leader and create/lead successful organizations in the future too. All these aspects prompted this paper which is meant as a book review not necessarily in

the traditional way of conceiving this kind of writing, but rather as a way of showing yet another example that students, future and present commanders may find useful when creating their own style of leadership. Obviously, also, as yet another springboard for discussions.

2. The main issues approached

To start with a few technical details, I should mention that the book is made up of 280 pages, including notes, acknowledgements, and an index. It has an introduction in which the authors make a kind of overview or outline of the main issues that are going to be approached and developed further on, presents the reasons and circumstances that led to their writing the book and the conclusions that could be applicable to any organization nowadays which I found absolute enticing for starting reading it: "... feeling comfortable or dodging criticism should not be our measure of success. There is likely a place in paradise for people who tried hard, but what really matters is succeeding. If that requires you to change, that's your mission"¹.

The first thing I found interesting when opening the book for the first time was the fact that I was expecting a book about leadership, about military leadership and about "rules of engagement" that might function in nowadays military organization. What I found instead when I browsed through it was that it was by no means only about the military; the examples chosen, the stories told, the anecdotes or cultural references actually belonged to a large variety of domains, from business to medicine and higher education. Moreover, the conclusions derived first hand by the four-star general from the actual experience as a commander of American and coalition forces in Iraq, Afghanistan, or the USA are useful and applicable to any kind of organization, all the more so in case of the military organization.

The book is structured as follows:

Part I: The Proteus Problem – this is the first chapter, which introduces the setting – Iraq, 2004 – and the problem – the fact that the troops needed to confront not only the enemy, but also the environment; not only the need for fast adjustment, but also the system's resistance to change.

Part II: From Many, One – the second chapter examines theoretical and practical aspects of teams taking the story to the hospitals in which medical personnel were working hard to save the lives of 2013 Boston Marathon's victims, on the deck of a warship confronting Somali pirates, and on board of an ill-fated United Airlines flight. All the stories and examples are meant to show that trust and common purpose are the essential elements that make great teams and that there is no need for a super-hero to forge super-teams.

Part III: Sharing – the third chapter introduces the reader to the concept of shared consciousness: "the way transparency and communication can be used in an organization to produce extraordinary outcomes across even large groups"² and, by making reference to NASA's Apollo project and a Special Operations mission in Fallujah, it shows how difficult it is to build trust within larger organizations.

Part IV: Letting Go – the fourth chapter approaches the concept of empowered execution which is supposed to be the second pillar of change within organizations; this means that taking responsibility for decision-making should be pushed downwards on the chain of command, while the senior leader should adopt the "Eyes On - Hands Off" model.

Part V: Looking Ahead – the fifth chapter serves as a conclusion and completes the circle started in Part I – the main story presented is the successful hunt for Abu-Musab al-Zarqawi – with the definite idea that efficiency, the once sole landmark of success has to be replaced by adaptability in structures, processes, and mindsets.

¹ General Stanley McChrystal, *Team of Teams. New Rules of Engagement for a Complex World*, Portfolio, Penguin, 2015, p. 8.

² *Ibid.*, p. 6.

Each part ends with a RECAP fragment, in which the main ideas, examples, conclusions of the respective chapter are reinforced once more, as a sort of reminder for the reader to go away with or as possible prompts for discussion and debate.

The book starts with a legend: the legend of Proteus, a metaphor of the need to adjust. Thus, the ancient story says that after long years of fighting a terrible war that took its toll from everyone involved, the Spartan king Menelaus, brother of Agamemnon and husband of the beautiful Helen was trying hard to get home from Troy. Menelaus and his men were shipwrecked on the island of Pharos and could not find any way to leave it. The goddess Eidothea, daughter of the immortal Proteus – the Old Man of the Sea – told him that there was only one way to leave the island: if the Greeks were able to defeat Proteus, then he would show Menelaus how to get home. The only problem was that Proteus was a polymorph, in other terms, a “shape-shifter”, so it was very difficult to catch and defeat him. So, Menelaus and his men, disguised in sealskins waited for the god to emerge from the sea and ambushed him. First, Proteus changed his shape becoming a great bearded lion, then a serpent, after that a panther, then a wild boar, after which a torrent of water and then a tree with soaring branch tops and so on and so forth. Still, the Greeks did not allow him to deceive them and as their weapons were of no use, the only thing they did was to cling to and clench their hands and legs around each animal, or plant, or water or fire and not let go. So, they did after all defeat Proteus and thus they were able to leave. The moral of the legend is, as McChristal puts it, “by adapting, the Greeks found their way home”³.

Actually, this is a symbol for the key issue that the whole book is built around – the fact that in this constantly changing world, everything happens at fast pace, everything is communicated, or the information is transmitted instantly thousands of miles away, the outcome of each action is completely unpredictable on long term, therefore there is a need for adjustment at the level of the individual and at the level of organizations.

The shape-shifters metaphor is illustrative of present-day state of the world which is characterized more than by anything else by rapid and continuous changes. In order to survive and thrive, any living organism has to adjust to the environment. In order to be successful and prolific, any organization has to adjust to the permanently changing conditions. Actually, the ability to understand and adapt to changes is perceived as one of the factors that make the difference between success and failure.

Team of Teams was first of all inspired by the transformation of Joint Special Operations Task Force (called simply Task Force or TF throughout the book) in the middle of fierce fighting in Iraq. Having to deal with an environment that was different from what troops had trained for or expected was an issue that needed careful thinking even before having to deal with the enemy. The interdependence of events and the speed at which things happened led to a strong sense of unpredictability and subsequently to a strong need for changing perspectives, hence the more abstract need for dynamic, constantly changing approaches. The main author himself says that even though there are countless books on management and leadership – including in the domain of military command, he felt that the transformation of TF had serious wider implications for almost all organizations.

The problem that general McChristal and the Task Force under his command faced in Iraq was that despite being “the best of the best”, as he puts it, despite comprising highly trained soldiers with excellent assets and great motivation, at first they were not making progress and even lost to attacks coming from under-resourced insurgency, with lesser means, but who did not seem to decrease in number or intensity. Although insurgency, escalation of radical movements and terrorist acts were not new threats, something the TF had not confronted before, the environment and the technology contributed to creating a new problem

³ McChristal, Stanley, *op. cit.*, p. 9.

set. Thus, the reorganization of the Task Force had to be initiated from the top downwards, based on the principle of information-sharing and from the bottom upwards through the decentralized decision-making authority, in other words, by turning it into a “team of teams”.

The key feature of a successful organization in the 20th century used to be, McChristal noted, efficiency. Even more so in the case of the military organization in which, by means of iron-clad discipline, people were dressed, taught, trained and drilled in the same way so as to become quickly and rightfully interchangeable parts of the fighting machine⁴. This standardization together with interoperability and uniformity – as much as possible in NATO forces as well – brought a certain predictability and order, therefore efficiency in combat. Yet, the 21st century brought with it awareness of the fact that the high quality of an organization was not to be measured in an abstract manner, in a vacuum, but it was derived in large measure from the compatibility with the surrounding environment. Thus, despite having high quality equipment and benefitting from the greatest training, the military organization had to change so as to become the best suited of its possible variants for that time and place.

In a world of unpredictable complexity, with unknown causes and little expected effects, dominated by quick technological development, people had to face a very diverse array of interconnected elements that interacted without a precisely identifiable pattern. The concrete situation that the general had to confront in Iraq was that in the time it took for a plan to be devised, endorsed and approved, the actual conditions of the battlefield would have changed, rendering its implementation completely irrelevant. Efficiency, that is, pursuing the perfect execution of known, repeatable processes, or “doing things right” was to be replaced by effectiveness, that is “doing the right thing” in the changed environment. In order to be able to oppose the new threats, besides developing the predictive ability based on data collection and processing, another asset turned out to be developing resilience and learning how to organically reconfigure to face the unknown. In other words, when faced with a network, the Task Force needed to learn how to become a true network themselves.

3. Building a team

Building a team means first and foremost building a relationship of trust among its members, both horizontally and vertically. A classical organization, including a classical military organization was characterized by at least two features:

- Efficiency;
- Centralized command and control.

Efficiency meant that the amount of time and information allotted to each individual got reduced to a minimum as everything was shared on a need-to-know / need-to-act basis. Centralized command and control meant that the endeavor was broken down into separate tasks and each of these tasks was assigned to somebody individually, downwards on the chain of command. These principles stemmed from the logic that above all, there is somebody who knows well what he/she is doing, who knows well who needs and who does not need to know a certain piece of information.

McChristal says, however, that working in a team is all about team connectivity. Thus, in order to work for the common goal, each of the team members needs to know what that goal is as well as the context. He beautifully calls this “the wiring of trust and purpose” and says that this is the only thing that gives a team “the ability to think and act as a seamless unit: a thorough integration of minds can generate far more complex and faster solutions to any issue than a set of individual thinkers”⁵. Actually, functioning safely in a constantly changing

⁴ See McChristal, Stanley, *Op. cit.*, pp. 34-35.

⁵ *Ibidem*, p. 125.

environment and under the pressure of time requires that every team possesses a “holistic understanding” of the whole mechanism⁶.

Obviously, it is much easier to build, lead and work within a small team. A great part of their effectiveness is owed to the fact that they are small – in these teams, by spending a lot of time and working together, people get to know each other pretty well. People get to complete one another and not compete with each other which is very beneficial for the common good. In larger organizations, however, people will be inevitably strangers to one another, it will be a lot more difficult to gain and enjoy the others’ trust. Actually, the larger the organization, the more difficult it will be to turn it into a team; it is going to take a lot of time and effort for it to reach that state of “oneness” that will ultimately result in an increased adaptability.

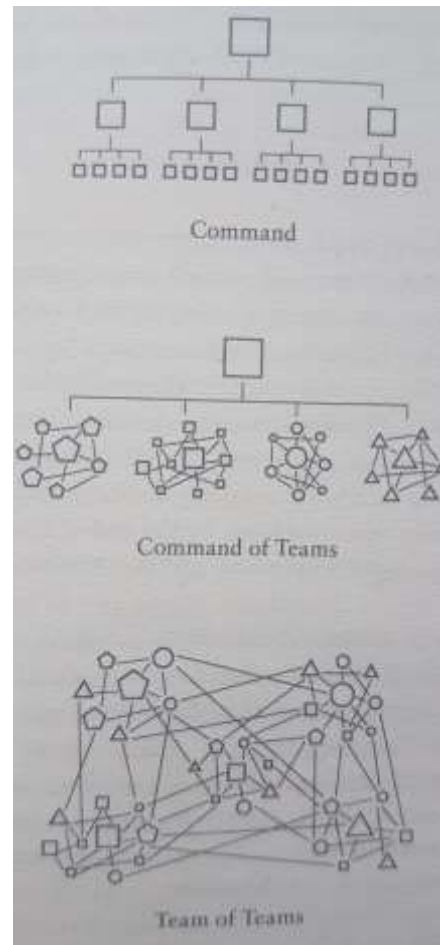
The best representation of the differences between a traditional organization, an organization based on the command of teams and an organization based on a team of teams is shown here⁷.

Thus, the ideal solution for ensuring both efficiency and adaptability would be, according to the book, to be able to turn the organization into a team of teams. In such an organization, each team plays the part of an individual in a small team; the individual members do not have to know each other personally or have a relationship on a personal level, it is enough for teams to trust each other, to lower the level of competitiveness and strife for “being the best” as all of them realize they are bound by the desire to reach the same objective which is a common goal and end-state. This will ensure, according to McChristal, strategic, not only tactical success. Thus, by fusing the generalized awareness with the specialized expertise of each team, the result will be the “adaptive organizational intelligence called shared consciousness”⁸, a *sine qua non* feature of a successful team of teams.

4. The shifting paradigm of the leader

The classical figure of the leader, especially the military leader, is that of truly remarkable qualities and heroic assets; every history book, documentary, piece of literature or movie says so. Actually, the movie industry has been playing a vital role in creating the image of the exceptional leader. Knowledge, vision and charisma, self-confidence, resilience, perseverance and calmness are all features of such exemplary leaders presented by war movies even nowadays which make them seem utterly unrealistic. Such a leader would be able to create and implement a brilliant strategy, while giving excellent orders and inspiring troops whom he would be able to handle like a puppet master.

Due to the rapid changes of today’s world and the huge impact of technology and access to information, the organization functioning like a machine tends to become less lucrative and even obsolete, just like the omniscient, heroic leader. Still, in the military and from the military, the same sort of leader seems to be expected more often than not; one



⁶ *Ibidem*, p. 141.

⁷ McChristal, Stanley, *op. cit.*, p. 129.

⁸ *Ibidem*, p. 142.

endowed with strategic vision, excellent anticipatory skills and encyclopedic knowledge about all the aspects of the respective job.

General McChristal says that at a lower level a small unit commander can lead his subordinates in this manner based on control. The unprecedented development of IT and communication tools may seem to have bridged the gap between leaders and subordinates at all levels. One might think that by possessing all that knowledge and information transmitted by people under one's command would be enough to make him/her capable of predicting what will happen in a certain situation. At a higher level, however, despite the technological boom enabling long-distance communication and real-time monitoring, the Iraqi experience showed that choosing the right course of action seemed quite an elusive task. Actually, in some cases, "the speed and interdependence of our current environment means that what we cannot know has grown even faster than what we can"⁹.

In this situation, empowered execution is needed, so as each leader, at his/her level to be in the position to make a decision – on the basis of shared knowledge, cultivated skills, and current assessment of the situation – in an appropriate timeframe. Which is the role of the senior leader then, one may ask? Here comes general McChristal interesting approach: he says that senior leaders are more needed than ever, but with a different role and different skills. Thus, the leader is no longer a "puppet master, but an empathetic crafter of culture"¹⁰. Moreover, the metaphor of the chess player as a game teaching strategy had to be abandoned because of the asymmetric character of war and the unconventional means used for fighting it.

Interestingly, the example given by the author instead is that of the gardening experience he had as a child. He says that even from that early age, he realized the role that a gardener plays in the fate of his plants: "if the garden is well organized and adequately maintained, and the vegetables are promptly harvested when ripe, the product is pretty impressive. The gardener creates an environment in which the plants can flourish. The work done up front and vigilant maintenance allow the plants to grow individually, all at the same time."¹¹ The best way to "grow" your team is actually fostering the right environment for their development.

Re-thinking warfare and re-shaping the force led to the development of a different kind of leadership. In this respect, general McChristal talks about the moment when, getting in the position that would enable him to make more decisions, he actually decided to make fewer and delegate decision-making to his subordinates. His primary concern was to create and cultivate the proper conditions and atmosphere for teamwork by explaining priorities with clarity, offering guidelines and especially leading by example.

The Eyes On – Hands Off model of leadership resulted in raising the level of the decisions made as subordinates took responsibility for what they decided and this turned into a sort of intrinsic motivation as well. Nurturing the independent decision-making abilities of subordinates, made throughout years, would ultimately pay off, resulting in stronger teams and better decisions. Only thus, could the agility, adaptability and cohesion usually characteristic of small teams pass on to the level of a higher organization.

5. Conclusion

The authors' conclusion, in light of what happened in Iraq and afterwards in Afghanistan was that, on the one hand, the constantly changing environment – at all levels and in all respects – makes it impossible to ever say that you have won a war once and for all, and, on the other hand, that the kind of organization carefully crafted on the new principles and relationships must be constantly led in the same manner. Otherwise, as general McChristal puts it, "stop pushing the organization up the hill and it doesn't continue or even rest in place; it rolls backwards"¹².

⁹ McChristal, Stanley, *op. cit.*, p. 222.

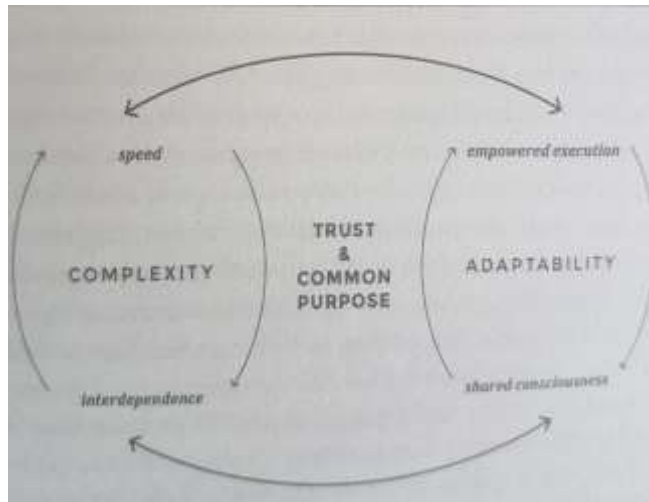
¹⁰ *Idem.*

¹¹ McChristal, Stanley, *op. cit.*, p. 225.

¹² *Ibidem*, p. 8.

Moving beyond the chess game paradigm and the move-by-move control which seemed natural to military operations, the author seems to have been able to prove that nurturing the organization so as to enable subordinates to function with certain autonomy determined and confined by the common concept for the fight, yet, free enough to execute actions as best they saw fit, would be the most important task of future leaders.

In this respect, the schematic representation¹³ of teamwork in nowadays military organization is rendered below.



The role of the senior leader did not lose its weight; on the contrary, it grew stronger as the senior leader was the only one capable “to ensure the operating rhythm, transparency, and the cross-functional cooperation needed”¹⁴. The days of the powerful leader who was as successful on the battlefield as he was in the briefing room seem to have gone and a leader’s great responsibility is to create and maintain a culture within the organization which is flexible and enduring.

Whether agreeing or not with the ideas presented and the conclusions reached by general McChristal and his colleagues, I am quite convinced that nobody could deny the fact that *Team of Teams* is scientifically documented and beautifully written. It is easy to read and fit for study. However, what I consider the most valuable aspect of this endeavor is the fact that it is based on true experience and unmitigated realities. As the back cover of the book says, “Through compelling examples, the authors demonstrate that the ‘team of teams’ strategy has worked everywhere, from hospital emergency rooms to NASA, and has the potential to transform organizations large and small”¹⁵. Returning to the English teacher’s position I started from in the first place, I consider the whole issue extremely interesting and useful as a classroom debate topic that I intend to implement in one of the speaking classes of the MA program whose results will be analyzed and developed in a future paper.

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¹³ *Ibidem*, p. 245.

¹⁴ McChristal, Stanley, *op. cit.*, p. 226.

¹⁵ *Ibidem*, back cover.

TEAMWORK IN THE MILITARY

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Abstract:

Teamwork, a common theme and desideratum of any functional entity, no matter its typology, size, relevance, notoriety or area of responsibility, does represent a mandatory and a necessary part of the organizational life, one of the basic and prerequisite conditions for existing, developing, progressing and having the desired success. The present paper was inspired by countless discussions with and among MA officer-students on their way to become higher echelon leaders and is based in large measure on their opinions.

Keywords: *group efficiency and effectiveness; functionality; military leader persuasive skills; organizational team spirit; interconnectivity.*

1. General aspects

Nowadays, we have heard a lot in so many and different circumstances about teamwork, about its critical significance, importance and relevance for the working mechanisms, relationships, climate, efficiency and effectiveness which altogether are the quintessence of any successful team.

Generally speaking, when you have to define the meaning and/or to find the clear definition of a word, apparently this is not rocket science since all you need is to google it or to check it, in a more old-fashioned way, into a dictionary. Besides, in this specific case, if we had to define the teamwork, which represents the generating reason, the primary subject and, also, the main focus of this paper, it would be very difficult and challenging for us to provide a by-the-book depicted and agreed on definition.

Anyway, just to make it clear from the beginning, in this case, the difficulty does not come from the meaning of the term, from the understanding and perception of the concept itself, but from its complexity and implications, from its wide translation into practice, from its applicability and availability in such numerous contexts and circumstances applicable and present in real life. And the simple explanation for that fact is an obvious one, since teamwork is an omnipresent and mandatory part of any line of work involving a professional team, group or organization, with a well-defined composition, a largely-validated organizational roster, a clearly-designed and completely-functional structure, and a multi-layered hierarchy¹.

Obviously, in any type of business, in any economic and social field of interest and activity, like industry, commerce, transportation, health, education, science, media, security, etc. in any cross-domain interaction and manifestation, without a specific plan, without a clear vision and practical intention of building the teamwork spirit among all members of the team, group or organization, any basic endeavor would be a mere fool's errand.

¹ Leroy, Jean-Francois, *Coordonarea echipei, dinamica grupurilor și coordonarea proiectelor* in De Visscher, Pierre; Neculau, Adrian (coord.), *Dinamica grupurilor*, Editura Polirom, București, 2001, p. 428.

In addition, without the joint action of the entire mass of the employers and the employees, bosses and subordinates, partners and peers, colleagues and coworkers, associates and collaborators, without a clear image of the evident rationale and imperious necessity of the teamwork implementation and refinement, without getting the best from all participants and contributors involved, every type of common projects which at least in theory has plenty of potential and can result in a successful outcome, in reality, will be from their very beginning a total waste of time and energy and misuse of the human, material and financial resources available, involved and allocated to that.

In this context, we are definitely not referring to a bunch of amateurs acting chaotically together by chance or by circumstances. On the contrary, we are thinking about a real team, a fully grown and developed organization, comprising a variable number of individuals permanently trying to adequately perform together, to complete and, why not, to compete with each other, to be efficient and proficient, to continuously raise the standards, to essentially contribute to a common cause, aim and/or end state. And coming back to the definition realm, which one would be better for describing the military system than this?

Due to reasons of personal and professional reasons regarding teamwork and especially teamwork in the military, I decided to make a sort of case-study and give 1st year MA students the task of writing – in the format of a 5-paragraph essay – their opinions on this topic. It should be mentioned that they are between 35 and 45 years of age, captains, majors and lieutenant colonels, with extensive experience in multinational exercises and NATO and UN missions. I relied on their input as they had acted as platoon and company commanders and they had, at the same time, been subordinates, parts in this complex mechanism, that is, the military system.

The task I gave was the following:

“A debate was launched by a magazine starting from the assumption that *in order to be a good leader, you must not only be excellent at working in a team, but also be capable of building teams that are greater than the sum of their parts*². Write a letter to this magazine expressing your opinion on this matter. Refer to the following aspects:

- **the qualities needed for working in a team;**
- **the characteristics of teamwork in the military;**
- **the ways and means of building a successful team – the leader’s role.”**

2. Qualities needed for working in a team.

These were, briefly speaking, the ideas mentioned under the first bullet point:

The literature in the field usually deals with leaders and leadership traits. If we change the perspective, however, and we focus on the team we realize that there are a lot of challenges that need to be faced in order for all members to become able to work as a functional and effective team. This requires from their part more than just knowledge in the respective field. It requires social skills, being able to work with others as equals, no matter if your knowledge and experience are above or below theirs, not being arrogant or patronizing, but at the same time not being reticent or shy, being helpful and willing to make sacrifices for the common benefit, especially when deadlines are pressing. Also, working in a team may mean being willing not to take credit for your work even if your contribution was the most remarkable.

• *A team is made of people. People are different in point of character, personality, intelligence (including emotional intelligence), up-bringing, education, work and life experience, expectations, values, ambitions and objectives. In order for that team to be successful, it is necessary for all those people to work together, side by side, for the common benefit of reaching*

² I found this quote on the second cover of General McChrystal’s book *Team of Teams. New Rules of Engagement for a Complex World*, Portfolio, Penguin, 2015 as a praise from Charles Duhigg, author of *The Power of Habit*.

*the goal. There is a saying in the military according to which “there is no me in a team”. **Loyalty** is the key concept here – loyalty to the other team members, to the team as a whole, to the common goal. The team in the military is all about selfless service, duty and comrades.*

*• The key word for illustrating what is needed for a team to work is **respect**. Vertically, up and down the chain of command, and horizontally, among peers, everybody must feel valued and respected, in other words appreciated as a part of the whole. Differences in character and personality and especially huge egos have to be neutralized and inclination towards sharing has to be cultivated.*

*• Great accent must be placed on the idea of **communication** – in order to build a strong team, the foundation of high performance, people need to communicate well with each other, sharing their thoughts, opinions, ideas, taking into consideration what the others have to say. Focusing on the common goal and the outcomes obtained as well as offering each other support will also contribute to successful teams.*

3. Military teamwork – specific features

There is no doubt, that every person familiarized with the historic background of the military, with its continuous evolution, development and modernization, with its typically working framework and specificity, with its unique principles and rules, with its defining structure and hierarchy, totally agrees that the above mentioned way of describing and defining accurately fits the way of functioning in the military.

The following bullet-point paragraphs were the most interesting aspects raised by students in their response to the second question – the characteristics of teamwork in the military:

• In the military it is easier to build teams. You start from the assumption of uniformity in dress, lifestyle, training. It is therefore easier to know each other very well and trust each other. Beyond personal connections, actions and relationships in the military depend on a set of rules that everyone obeys, the Standing Operating Procedures that can contribute also to feeling of mutual reliability. On the other hand, a team must be built, not taken for granted. One must remember that if a team is not working, it sometimes may be the fault of the team members, but it is **always** the fault of the leader.

• In the military, teamwork is the most important characteristic of the organization, first and foremost because no one, including the Chief of the team, can accomplish the task by himself. Team members need to know each other very well; they need to know their vulnerabilities and strong points. Even more so, in a conflict, every member of the team needs to use his/her skills, knowledge, and experience in order to help each other and even save their lives. **Comradeship** is the key word in the military.

• Military teams are very particular in the sense that they resemble families more than in other domains. They live together, eat together, drink together, train and work together and sometimes even die together. This feeling of togetherness and belonging are in many cases exemplary and in many cases the main reason for the successful accomplishment of really hard tasks. The leader’s role in this regard is essential in the sense of creating an excellent atmosphere: everyone has to come to work with the same feelings they go home.

• In the military, especially during exercises and missions, a team may find itself in a very difficult situation which calls for fast decisions and actions – for that, the members of the team must have full confidence in each other and in the good judgment of the leader. The key word is, therefore, **trust** and this kind of trust is forged during years of training and working together, as well as through the discipline and respect to the military values. Trusting your “buddies” with your life is the supreme outcome of a well-built team.

• In the military, you do not only need to have confidence in your qualities and skills, but in your team-mate’s qualities and skills, too and just as much. Teamwork is therefore based on openness, trustworthiness and unconditional support. Being kind without

being lenient, empowering people, being strong without being harsh or mean, speaking clearly without yelling.

On the other hand, there is no doubt that when it comes to the military and its subsequent plethora of activities, willy-nilly, we have to bring into discussion an entire spectrum of missions and tasks which in their complexity and dimensions, without exceptions, involve both the teamwork concept and the teamwork materialization, manifestation, and implementation. As a direct result, on a daily basis, all specific activities and actions in which the military personnel are involved, should be seen and defined as a clear, undisputable teamwork effort. Moreover, even though at a first, unexperienced glance, all of the above activities and actions could be perceived as an active duty routine, nothing special and out of the ordinary, we are definitely talking about a total different, if not, opposite story.

Consequently, no matter if we are referring to a variety of circumstances like attending career courses and education in military institutions, training in simulators, participating in military exercises and realistic drills in fire-ranges and instruction camps, proudly marching during a military parade, respectively, operationalizing and certifying a military structure/entity, maintaining the level of forces preparedness and improving their level of readiness, repairing and maintaining functional and operational the military equipment, technique and platforms to preparing, deploying and taking part in missions and operations abroad, planning at operational or strategic level, both in national and multinational headquarters, executing plans at pure tactical level, evacuating the injured and wounded in action, searching for those missing in action, etc. all of these specialized actions and activities request a tremendous common effort from the team and the overall military organization in order to achieve the priority objectives and primary goals set up by the higher echelons and commanders.

On the one hand, being in the military, being member of any military entity means to play by the same rules, to follow a set of strict behavioral norms and regulations, to obey orders, to understand the necessity and the complexity of the chain of command, to be disciplined and professional, to be eager and interested in learning and knowing more, to prove a forged motivation and unbreakable loyalty, to act together with the others, to be part of a strict but also dynamic “choreography”, involving one cohesive team with a common goal, that should be sufficiently trained and prepared so as to always be ready for action.

On the other hand, as it is the case for any other organization, being in the military means to coexist and to be confronted with various typologies of people with different personalities, skills and motivations, with different social and cultural backgrounds and sometimes even with different religious believes. Also, in the military, that means to interact both with superiors and subordinates, to coordinate and work with peers, to encounter people belonging to different services who, consequently, have different general and specialized knowledge and professional expertise, different degrees of battlefield-gained experience, differentiated if not opposing personal perceptions, and sometimes totally divergent priorities.

So, beyond those subsequent implications of being part of a non-arguable, pre-established and top-down chain of command, beyond their ranks, designated positions and functions within the organization, the members of the team must be sure of the fact that all the parts of the team are on the same boat, and also are on the same page when it comes to understanding and taking responsibilities, acting together no matter their specific nationality, age, gender, color of the uniform, specialty or area of expertise.

Firstly, everybody must be aware by the fact that even though each of them, individually, could possibly represent a real asset for the organization and be an essential part of the entire mechanism, their overwhelming force and power, their validated efficiency and credibility, their manifest advantage come from **the elaborate way of working, acting and interacting as a whole**. Everybody must understand that the teamwork is the trigger, the

explanation and the reason for this, not the individualism, the isolated actions inside of some small, disrupted and uncoordinated groups, not the misinterpretation of the basic rules of coexisting together, supporting and completing each other, like puzzle pieces. And this, in our opinion, means that the teamwork foundation is nothing else than the merged effort, the togetherness, the cohesion, the inclusive approach and co-action of all team members.

Secondly, the team involves **a common vision**, a common rhythm, a common and balanced approach, common implication and involvement, common determination and commitment, commonly-shared willingness to get on with each other and un-dissimulated trust in each other. All of these should converge and assure the fundamental preconditions for a high degree of operational harmony, synchronization, complementarity, functionality, efficacy and effectiveness among its members.

Thirdly, the team members must be able to make out of their team **a professional, reliable, responsible, mature, forged, interdependent entity**, able to adapt itself to different contingencies, multiple courses of actions, situations and circumstances that request a coherent coordination and making decision mechanism, a wise management. Undoubtedly, that can be assured only by an open-minded and dependable leader, full of skills, knowledge and expertise, one who possess and permanently builds enough leadership abilities and practice for controlling the team under his/her command, for maximizing its potential, for building internal relationships, promoting respect, dissolving and eliminating any lack of trust between group members.

Therefore, by having in the same team both rookies and veterans, juniors and seniors, males and females, officers and non-commissioned officers, enlisted and privates, Army, Navy and Air Force personnel, the person in charge must be highly focused on the unity of action and effort of the group under his/her command. In other words, that must be translated into **promoting inclusiveness**, alleviating stress, eliminating frictions and tensions, discussing freely with everyone, being aware of his/her subordinates' concerns, worries, needs and expectations. This way, the leader can really stay connected to his/her team so as to show them that beyond his/her rank, position and uniform is a human being, not a robot, opened to dialogue, to viable initiatives and solutions coming from the members of the team.

4. The leader's role in building successful teams

Additionally, beyond the aforementioned skills, the one formally in charge of the group does have to know what is right and appropriate, and how to put this in the context, how and what to do for fulfilling and legitimizing himself/herself as a military leader. For that, he/she must have the ability to provide uninterruptedly guidance, to supervise and give a hand to everybody in his/her team, to confer and assure credibility, consistency and coherence in approaching, to identify any possible regulation/legal, financial and human resources caveats and limitations, to overcome obstacles and barriers of any other nature that could affect the teamwork spirit, unity, cohesion, and effectiveness.

For example, by knowing and being aware of the possible negative effects and implications in his/her team of different behavioral misconducts like indiscipline, disobedience, bullying, discrimination, disruption, etc. which sometimes emerge or are almost naturally provoked by this restrictive, competing and stressful environment, the military leader must be able to profoundly consider them, to examine and understand the way these could impede on the achievement and completion of the final, ultimate, common goal of the team³. Also, it is essential for the leader to know how to prevent and to counter them, and to deter any potential perpetrators who could complicate and aggravate the situation. Only thus

³ See <https://www.forbes.com/sites/jeffboss/2016/05/04/5-leadership-lessons-i-learned-from-the-military-and-what-they-mean-for-you/#3b7bf3c73de5>, accessed 20.02.2019.

should the leader be legitimized as a real mediator⁴, the stability and normality driver, the buffer against any further norm violations and the one able to curb excesses or the one who is widely recognized as being both entitled and capable to solve rapidly and efficiently all relevant issues and conflictual situations among the group.

The leader, whether military or not, has never been alone and cannot function alone. He is surrounded by people that he has to rely on and the most important issue in order to be able to rely on them is being able to trust them. You cannot work, or at least, not efficiently, with someone that you cannot trust and in order to trust somebody you first need to take time to get to know him/her and then decide whether the respective member of your team is trustworthy or not.⁵⁶

Regarding the leader's qualities and role in building teamspirit, the students had a lot of ideas. Some of the most frequently mentioned aspects are listed below:

- A leader has to be a good teammate and a good superior at the same time, which is pretty hard to achieve. How can you be on the same level with the others so as they perceive you as such and simultaneously keep enough distance to get your orders obeyed? Being a good communicator, possessing good communication skills is the key in this respect. If you can communicate clearly enough, offer guidance and support, motivate and even influence them through your simple words, then you are a good leader. Also, possessing intelligence and practical skills may not prove enough in the absence of common sense and empathy, a developed emotional intelligence and selflessness.

- As a leader, you need to be able to split the tasks so as to suit the "profile" of each individual and at the same time, motivate your team members to do their job at the highest standard possible. Moreover, you need to help the less experienced members of the team learn and get better at what they need to do. Fair judgment, on the other hand, is needed, starting with the regular brainstorming activities during meetings in which an equal share of attention and consideration.

- The best situation is when the formal leader has the necessary characteristics to become the informal leader as well. Through attitude, knowledge, experience and behavior, the leader has to be a model for the team including matters related to and requiring teamwork. In order to be a good leader in the military, you have to be a good soldier yourself in all the meanings of the word. Only thus will you gain the admiration and appreciation of your superiors and, more importantly, your subordinates.

- On the one hand, leading is the art of managing people and assets in order to accomplish certain goals. Schools and universities have libraries full of materials on leadership. Yet, true leaders are certified by something else than a diploma. True leaders are **more oriented towards the team than towards the goals**, they are respected and even loved by their subordinates. They work shoulder by shoulder with them, come first and leave the office last.

- Building a team can be considered the supreme task for an officer, no matter his level of command. When he takes over his appointment, he can only hope for men and women who are well prepared and trained; more often than not, they are mere individuals united by a place of work and a common mission. The leader's role is to put together these pieces and, in a reasonable amount of time, make them act as perfect pieces of a mechanism. All variables have to be taken into account: age, gender, religion, experience, family life etc.

⁴ For information referring to the most essential characteristics of the leader as head and at the same time part of a team, see Zlate, Mielu, *Leadership și Management*, Editura Polirom, București, 2004, pp. 31-36.

⁵ Mr. lect. univ. Lehaçi, Tudorel-Niculai, *Etica și Leadership* (Curs universitar), Editura Universității Naționale de Apărare "Carol I", București, 2015, p. 8.

⁶ For information referring to the most essential characteristics of the leader as head and at the same time part of a team, see Zlate, Mielu, *Leadership și Management*, Editura Polirom, București, 2004, pp. 31-36.

The only way to neutralize all discrepancies is to act like a model for them and thus inspire their development in this regard. Allowing team members to learn and grow is equally important!

- In practical terms, a successful team can be built starting with the recruiting/selection process in which you can identify the profile needed for occupying a position in the respective team and then find the person that corresponds to that profile. This is actually almost impossible in the military as you are appointed and therefore you do not get to choose your team. Anyway, through appropriate training, the leader has the duty to improve everyone's skills or build complementary ones as well as mitigate the possible incompatibilities among people.

- Being open to suggestions – at least to hearing them out – and allowing team members to freely express their opinions will contribute to your gaining their respect and trust. Minimizing a team member's contribution or, even worse, making fun of him/her will not only make that person refrain from saying anything in the future but there are also chances you will forever lose his/her genuine respect maybe the other team members' too.

- Another thing that the leader has to do is to know when to allow the team members think for themselves and make decisions, always remembering to support and encourage the members, no matter the results obtained, and thus increase their motivation. A team could have good results with average professionals in their field that are highly motivated, supported and guided by an excellent leader, which is absolutely impossible in case of excellent team members with a poor leader.

- The leader has to be versatile, yet undeterred in his/her aim of building a successful team. In order to do so, the leader has to have each member of the team do what he/she is best at, complete each other, make up for the weak points or deficiencies, take advantage of the strong points, talk some sense into each other, as well as praise each other when needed.

- The particular features of leadership in the military, the hands-on learning sometimes, and the feeling of being responsible in all the ways for the lives, wellbeing and deeds of the people under your command resulted in an impressive percentage of most successful leaders and entrepreneurs in the world having served in the military.

It is obvious that the overall idea is to have and prove enough wisdom, diplomacy, decency, patience and flexibility, to form and, of course, to specialize yourself in order to act as a natural leader, to create your own persuasion and coercion methods, to be open-minded, approachable, creative, and reliable, but also to have a hand in everything, if necessary a strong one, in order to make your team put away any kind of rivalries, personal ambitions and agendas. By these, a leader can convince his/her team to stay on track, to keep the pace, and to act together as a real, undivided and consolidated organizational entity, one that is completely prepared and able to reach all the performance standards and criteria.

Instead of being an unpredictable, arrogant, and bossy-style “master of disaster, any real, born leader must be simultaneously the master-mind behind the master-plan, the master and commander, and even the master of ceremony in terms of managing and orchestrating everything, being the one handling the way and means for achieving the goals, the one deciding and adapting the battle-rhythm to the organizational needs and realities, the one imposing new rules, adjusting or annulling the old ones if necessary, the one keeping all members of the military entity interconnected and mutually interdependent. Additionally, in order to ensure a highly appreciated, completely functional, not distressful or frustrating working climate, the leader has to give and assign doable and reasonable tasks, to be able to pick the right people for each of them, to set realistic and achievable deadlines according to the effort needed and the time available.

Furthermore, the leader needs to pay attention to the way of calibrating the effort and dispersing equitably these tasks throughout the organization and to assess overtly and covertly

each ongoing phase of the process in order to prepare the next ones and to be ready for them till he/she is satisfied by the overall development and the final outcome, and if the situation and circumstances require this, on a case by case basis, to readjust his/her level of ambition.

These are supposed to be the preconditions for a successful approach, for making any individual feel himself/herself an useful and important piece of the “working machine” for driving everybody to give their best unconditionally, for gaining minds and souls, for exploiting to the maximum possible level all the potential, talents and abilities, for making everybody understand that there is no room for compromise, self-sufficiency, independent, chaos-generating attitude and actions, selfishness and laziness. Also, for the leader himself/herself, it is essential to overcome the tendency to engage only the most experienced people or to make use only of those eager-beaver subordinates who are always ready to be employed in everything, and to assure a balanced assignment of the tasks among the team members.

Besides all these, by being an active part of the team job and effort, the leader himself/herself needs plenty of stamina, charisma, some wide range knowledge and expertise, and strong willingness for direct implication as a model and motivator for the others⁷. By this, all strategic, operational and tactical commanders must be able to make the others be aware of the essence of the esprit de corps and the important role played by all brother and sisters of arms affiliated to the military system, which at the end of the day is a big family with its own rules, structure and subsequent hierarchy, with some clear delineated goals, objectives, missions and tasks that request and are based on the teamwork itself.

To conclude, we do believe that the teamwork does represent a common task, goal or performance-focused set of activities, which implies more than reliability, fellowship, collegiality and camaraderie, respectively a tremendous and coordinated effort under activating, motivating, and uniting leadership. Eventually, the teamwork foundation is an art involving and precisely directing the common efforts, and also those tightly entwined personal motivations, aspirations and ambitions, in which leader’s traits, role and posture are instrumental, since he/she is supposed to be at the same time an essential part of the team and the head of it.

Teamwork is a “must have” of the modern society and a crucial part of all non-military and military organizational life, based on both human and professional relationships, built and forged through a concrete partnership, a genuine solidarity and a constructive cooperativeness, a non-discretionary reciprocity among team members, a combination of synergy and togetherness, a unity of ideas, an emphasis of potentials and capabilities, a sum of skills, enthusiasm and eagerness of all human beings involved and focused on the accomplishment of their goals. Clearly, these healthy teamwork principles have become an indisputable part of our contemporary society, acknowledged as that sort of minimal requirement and logical step for building and getting a “dream-team”, that sort of unique and extremely specialized and efficient working environment based on personal contributions smartly channeled and fructified by close collaboration, tight cooperation, and master coordination.

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FINANCING ROMANIAN EDUCATION. A CURRENT DEBATE

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Abstract:

Higher education has expanded considerably over the last decades. After 1989's revolution, an increased interest was felt in Romania with regards to the pursuit of higher education. In this context, universities have been confronting more and more with financial problems related to insufficient funds directed by the state. The purpose of this article is to analyze how the incentives offered to Romanian universities can influence the number of enrolled students. We will consider the level of budget allocations for student transportation and the value of merit scholarships in universities. In order to analyze whether the number of students is influenced by the level of the budget allocations for transport, respectively by the merit scholarships, we will use a multiple linear regression model.

Keywords: *education funding; higher education; budget allocations; merit scholarships.*

Introduction

Trends within higher education in Central and Eastern Europe

Education is a decisive factor of evolution, a business card of a nation. That is why the educational system is at the basis of the development of a society, directly impacting all the other social components, especially the economic one. Higher education has expanded considerably over the last decades. Enrollment rates have greatly increased in almost all developed countries, by expanding both the number of local students and the international students flow. As a result, public spending has increased, but not enough to keep up with the increased demand for higher education.

There are a number of debates around the world that many practitioners and researchers have exchanged views over time, namely: the role education should play in creating a more egalitarian society and the extent to which education should be provided through the public sector, or through the private sector¹. Education can only play a positive role in the development of a society.

The issue of higher education funding is perceived in different forms both in developed and developing countries. In Central and Eastern European countries, after 1990, the demand for higher education has increased significantly and has been further intensified with the adherence of these countries to the European Union².

In countries such as Bulgaria, Slovenia or the Czech Republic, the main way to finance education is through a direct allocation of state funds³. After 1990, when the urgent need for higher education was felt, most of the Central Eastern European countries

¹ Hare, P. G. & Ulph, D. T., *On education and distribution*, Journal of Political Economy, 1979, pp. 193-212.

² Erina, J. & Erins, I., *Assessment of higher education financing models in the CEE countries*, Procedia - Social and Behavioral Sciences, 2015, pp. 186-189.

³ *Idem*, p. 2.

restructured the financing model of higher education, reallocating a certain part of the student's funding burden in tuition fees.

Thus, the level of education funding has been an issue that has been widely debated for generations. Erina J. and Erins I., in their work on the evaluation of higher education funding models in Central and Eastern European countries, argue that it would be necessary to identify new sources of funding, as the financial resources allocated by the state are insufficient for ensuring the implementation of a proper and efficient education process. They also identify potential sources that could support the reallocation of funds allocated by the state, of which we can mention the structural funds coming from the European Union, the revenue of educational institutions such as study fees, project revenues, services, patents. They even propose a calculation formula for allocating funding to higher education that does not take account of the individual and the characteristics of each country:

$$N = S_v \times F_m + (S_v^i - S_v^a) \times F_s + N_g + N_{ep} + N^i \text{ where,}$$

- N – annual income of the higher education unit;
- S_v – the number of students financed by the state;
- F_m – student co-financing (tuition fees);
- S_v^i – the number of students enrolled in the first year;
- S_v^a – the number of expelled students;
- F_s – the funding from the state budget allocated for a full-time student in that year;
- N_g – state subsidies for scientific research, allocated to defined members of the academic staff of the higher education institution;
- N_{ep} – funds received as fees for academic, scientific and expert services;
- N^i – state investment in the modernization and construction of buildings, purchases and maintenance of equipment.

Leaving aside the institutional sphere of education funding, we must also take into account the indirect beneficiaries of this, namely the students themselves. There are numerous researches that focus on the individual as the main beneficiary of investment in education, which naturally has led to numerous debates and controversies. In this approach one can observe two directions: the endowment of individuals with abilities and their access to resources.

The first direction mentioned starts from the idea that the equality of expenses for different individuals does not produce equality of benefits for them, ie the equality of expenses for different individuals does not produce equal benefits for them⁴. This is because individuals possess certain abilities that enables them to take advantage of education or not⁵. This issue, which has been debated since 1971, seems to have been understood by both governments and educational institutions. Most countries, until they had a significant level of higher education, funded this sector without evaluating the performance of the universities benefiting from these funds. Once higher education has become a mass phenomenon and financial pressure has increased considerably, there has been a natural tendency towards financial responsibility and finding alternative sources of funding. If we bring into question governments' responsibility for resource allocation, we must also take into account the responsibility of individuals.

In the paper “Estimate the effect of student aid on college enrollment: evidence from a Government Grant Policy Reform”, authors Nielsen HS, Sørensen T. and Taber C. argue, following the analysis of the Danish education reform of the 1980s, that students from poorer families are more responsible about their educational subsidies than students from richer

⁴ Arrow, K. J., *A Utilitarian Approach to the Concept of Equality in Public Expenditures*, Oxford University Press, 1971, pp. 409-4015.

⁵ Ulph, D., *On the optimal distribution of income and educational expenditure*, Journal of Public Economics, 1977, pp. 344-356.

families. On the other hand, recent studies call into question the fact that educational institutions have a high degree of responsibility in achieving students' goals, namely obtaining a diploma⁶. This does not mean that students have no role or responsibility in achieving the objectives, but that responsibility is shared with the education provider.

The second direction is concerned with the access of individuals to material resources without which no one can attend a university. We debated in the first part of the material that these resources mainly come from the public environment, the proportion varying according to the level of development of a state, but it can also come from the private environment through study credits, whether or not guaranteed by state and, last but not least, through family funding. Here, the discussion can be extremely varied, but the main idea supported by research is that children from poorer families have a higher risk of not receiving education because their parents' income is too low to finance their education. However, the education of these children would be socially effective because the cost of providing better education is less than the productivity gains that would result from being educated, thus avoiding the poverty trap⁷.

Higher education in Romania after the revolution of 1989

Romanian education has undergone, since the Revolution (1989), a series of reforms aimed at changing the educational system. These were, however, insufficiently debated reforms, which have often been implemented in part only, whose implications have not been well established and which have created a lot of chaos, insecurity among students, teachers and parents and which, at the same time, led to the public's lack of confidence in the state's ability to manage the problems that arise in education.

In 1998, in Romania, on the basis of an old-fashioned financing mechanism built on historic costs, government allowances fell sharply, and the state, in order to limit its financial effort, implemented two measures. The first measure consisted of allowing students to enroll and pay the tuition themselves starting 1998, and the second was the introduction of a new formula-based funding mechanism, in 1999.

The financing of the education system is regulated by the National Education Law no. 1/2011 with subsequent amendments and supplements, which stipulates that the financing "is based on and within the standard cost per pupil, pre-school or post pre-school, as the case may be, according to the methodology developed by the Ministry of National Education respectively by means of study grants calculated on the basis of cost average per equivalent student per domain, per study cycle, and per language of instruction"⁸.

This method of calculation has considerably diminished the budgets of educational institutions, so that within a few years the salary grids have considerably evaporated and the expenditures with the facilities of the material base have become almost non-existent, with the financing just reaching the cost of utilities. Thus, the budgets of the educational institutions have come to be the result of multiplication of the standard cost, established annually by the Government Decision, with the number of pupils / students / master students / doctoral students. Suddenly the pupil / undergraduate / masters / PhD student became the main engine of education institutions for revenue generation.

The evolution of the number of students for the period 2008-2016 is shown in Figure 1, where it can be seen that in 2008 there were 650,247 students, and in the year 2016 there were 449,152, which means a 31% decrease in the number of students.

⁶ Hossler, D., Ziskin, M., Gross, P. J., Kim, S. & Ceckic, O., *Student aid and its role in encouraging persistence*, Higher Education, 2008.

⁷ Brham, V., Boadway, R., Marchand, M., & Pestieau, P., *Education and the poverty trap*, European Economic Review, 1995, pp. 1257-1275.

⁸ National Education Law no. 1., 2011.

The problem we are trying to bring to the foreground is the discrepancy between the need for education and the limitation of state resources in support of the educational process, which is why we are still place last in Europe to the number of graduates.

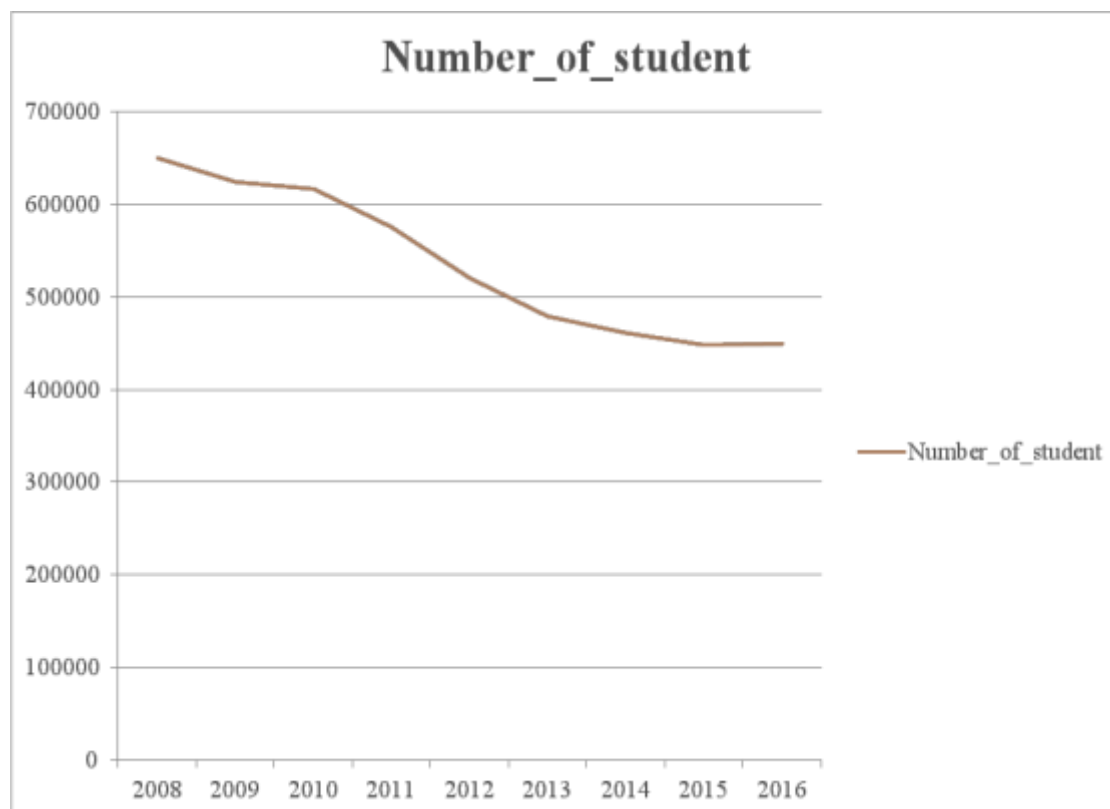


Figure 1. The evolution of the number of students between 2008 and 2016 in Romania

Methodology and data

At Romania's level, a consultative body has been functioning since 1995, the National Council for Higher Education Financing (CNFIS), which according to art. 219, par. 2 of the National Education Law no. 1/2011, must submit an annual report to the Ministry of Education on the state of financing of higher education and the optimization measures required. The CNFIS Council has taken further steps to optimize the higher education system, so the report addresses institutional and organizational actors interested in the higher education system who can make an important contribution to the development of informed public policies in this field. Among the problems highlighted by CNFIS, we can recall that the financing of Romanian higher education is insufficient to increase the quality of higher education and the competitiveness of universities in Romania in the medium and long term and, at the same time, it is necessary to establish a coherent strategy and a set of priorities for the long-term development of the higher education system.

Direct and indirect incentives to finance higher education

Since education funding is a fixed percentage of GDP and the budget of higher education institutions is the result of the application of a mathematical formula, with the number of students as the main variable, we need to see to what extent indirect incentives can influence the number of students.

In this analysis, we applied an econometric method to see if there is a dependence between the number of students and the two variables we choose – the budget allocations for public transport distributed to universities and the second variable – the amount of merit scholarships in universities.

The first variable chosen, the budget allowances for transportation, may lead to an increase in student mobility and, implicitly, in the number of those attending university.

The second variable, the quantum of merit scholarships, can influence the number of students enrolled in a university with financial aid provided. We chose these variables to see how changes in the income structure can influence the number of students enrolled in a university.

For this analysis we took into account 48 state universities from Romania, the number of students who attended the university courses in 2016 and the two variables listed above at the level of 2016 (Table 2). The data analyzed is taken directly from the Annual Report - 2016 made by CNFIS for the year 2016.

Multiple linear regression

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Scholarship, Budget allocations for students ^b		Enter

a. Dependent Variable: Total number of students

b. All requested variables entered.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	,930 ^a	,865	,859	3157,227	,865	143,888	2	45	,000

a. Predictors: (Constant), Scholarship, Budget allocations for students

b. Dependent Variable: Total number of students

The specified model explains 86% of the variance of the dependent variable *Total number of students*.

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2868567251,883	2	1434283625,942	143,888	,000 ^b
	Residual	448563674,783	45	9968081,662		
	Total	3317130926,667	47			

a. Dependent Variable: Total number of students

b. Predictors: (Constant), Scholarship, Budget allocations for students

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3398,312	1546,505		2,197	,033		
	Budget allocations for students	11,307	,680	,932	16,632	,000	,957	1,045
	Scholarship	-,720	4,127	-,010	-,174	,862	,957	1,045

a. Dependent Variable: Total number of students

The result in the Coefficients table shows that the student budget allocations variable has a significant influence on the total number of students. Constancy of the model is significant, because sig. is 0.033 < 0.05. The Tolerance Indicators > 0.10 (0.957) and VIF < 10 (1.045) indicate that I do not have multicollinearity problems, and independent variables do not correlate strongly with each other.

Interpreting parameters:

- $b_0 = 3398,312$ (average value of the *Total number of students* when the *Budget allocation for students* is 0 is 3398,312);

- $b_1 = 11,307$ (at an increase with a unit of the *Budget allocations for students*, the total number of students will increase, on average by 11,307, as the *Scholarship* will remain constant);

- $b_2 = -0,720$ (variable *Scholarship* does not influence the variation in the total number of students; sig. = 0.862 > 0.05 why we will not interpret the result b_2);

We can say that the variable *Scholarship* does not have a significant influence on the dependent variable, so that the explanatory model will contain a single factor of influence represented by the *Budget allocations for the students*.

For the developed model, we verified the assumptions about errors.

The average of errors is null

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Unstandardized Residual	48	,0000000	3089,32160419	445,90516495

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Unstandardized Residual	,000	47	1,000	,00000000	-897,0454856	897,0454856

When verifying the the Average of errors is null, sig. the test statistic is 1,000 > 0,05, which allows us not to reject the null hypothesis. With a probability of 0.95 it can be stated that for the specified model, the average of the errors is null (the model fulfills the hypothesis).

Errors are homoscedastic

Correlations

		Budget allocations for students	Scholarship	error_abs
Budget allocations for students	Pearson Correlation	1	,207	,254
	Sig. (2-tailed)		,158	,082
	N	48	48	48
Scholarship	Pearson Correlation	,207	1	-,041
	Sig. (2-tailed)	,158		,784
	N	48	48	48
error_abs	Pearson Correlation	,254	-,041	1
	Sig. (2-tailed)	,082	,784	
	N	48	48	48

To verify the hypothesis of homosceasticity, we verified the Spearman correlation coefficient between the independent variables and the errors in absolute value for obtained the model. Its value sig. for both independent variables is greater than 0.05, which means we do not reject the null hypothesis that errors are homoscedical.

Errors are normally distributed

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		48
Normal Parameters ^{a,b}	Mean	,0000000
	Std. Deviation	3089,32160419
Most Extreme Differences	Absolute	,115
	Positive	,115
	Negative	-,110
Kolmogorov-Smirnov Z		,797
Asymp. Sig. (2-tailed)		,550

a. Test distribution is Normal.

b. Calculated from data.

To verify this hypothesis we used the Kolmogorov - Smirnov test. Since sig. = 0.550 > 0.05 we do not reject the null hypothesis and we can assert 95% probability that errors are normally distributed.

Errors are not autocorrelated

Runs Test

	Unstandardized Residual
Test Value ^a	-47,24453
Cases < Test Value	24
Cases >= Test Value	24
Total Cases	48
Number of Runs	20
Z	-1,313
Asymp. Sig. (2-tailed)	,189

a. Median

Since the value of sig. = 0.189 is lower than the 5% risk, we reject the null hypothesis. With a probability of 95%, we can say that the errors are autocorrelated and the model does not fulfill this hypothesis.

We can say that by developing this model with the two independent variables (*Budget allocations for students*, *Scholarship*) only one of them could prove the variation of the dependent variable *Total number of students*. Variable The amount of the merit exchange does not significantly explain the variation *The number of students*. Since the *Scholarship* variable did not have a significant influence on the total number of students, the model chosen by us will be a linear regression model with a single predictor.

The principal component analysis

Results of the descriptive analysis of the variables included in the analysis

Descriptive Statistics

	Mean	Std. Deviation	Analysis N
Budget allocations for students	550,28	692,384	48
Scholarship	365,67	114,050	48
Total number of student	9357,33	8401,027	48

According to descriptive statistics, the universities in the observed sample have an average of 9357.33 students who have an average exchange rate of 365.67 lei and budget allocations for transport amounting to 550.28.

Values of the KMO test statistic and statistics χ^2

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,519
Approx. Chi-Square		92,348
Bartlett's Test of Sphericity	df	3
	Sig.	,000

It can be guaranteed with a probability of 0.95% that there are statistical links between the variables considered, as the χ^2 statistic leads to the conclusion of the rejection of the variability independence hypothesis.

Kaiser-Meyer-Ohlin statistics (KMO) gave a value of > 0.5 indicating that there are statistically significant (mediocre) links between the variables chosen, so PCA can be applied.

Own values and variance explained by the factorial axes

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2,006	66,853	66,853	2,006	66,853	66,853
2	,925	30,820	97,673	,925	30,820	97,673
3	,070	2,327	100,000			

Extraction Method: Principal Component Analysis.

From the table of the explained variance, the first two factors explain 97,673% of the total variance of the initial data. The first factorial axis explains 66,853% of the total variance and the largest differences between the statistical units. The second factorial axis explains 30,820% of the remaining variance.

Coordinates of the variables in the system of the two factorial axes.

Component Matrix^a

Component	
1	2
,968	-,167
,375	,927
,963	-,193

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

The values in table show the position of the variables on the factorial axes. The *Budget allocation for student* and *Total number of students* have a high positive (close to one) positive coordinate on the first factorial axis (0.968 and 0.963, respectively). According to Figure 1, their positioning on the same side of the dial indicates a positive relationship between the two variables. For the second variable factorial axle the *Scholarship* has a high positive coordinate (0.927), and the *Budget Allocation* variables and *Total number of students* have a negative coordinate.

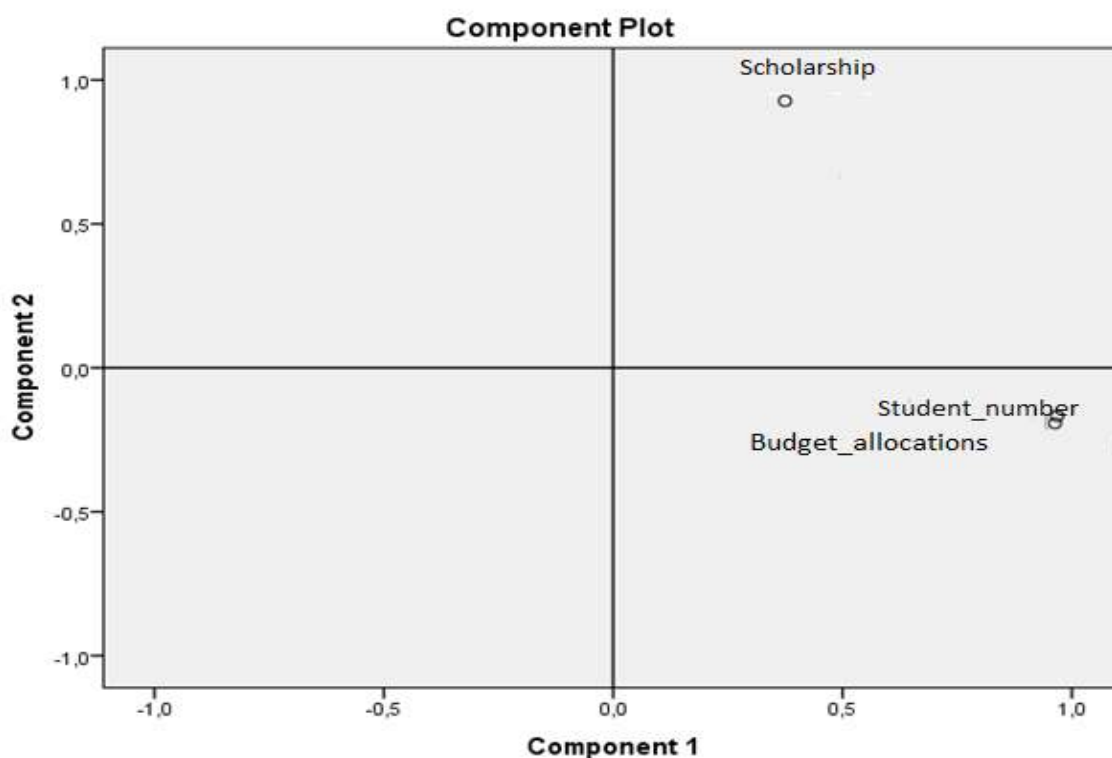


Figure 2. Graphical representation of variables in the first two factorial axes

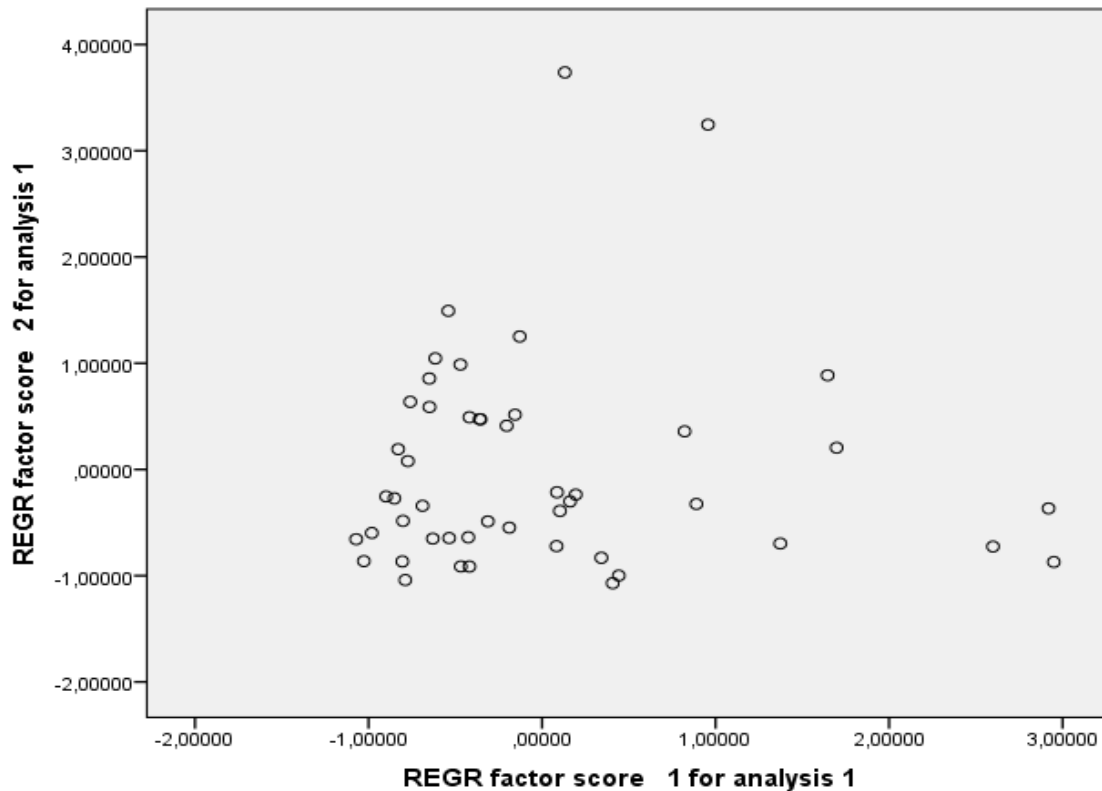


Figure 3. Representation of statistical units in the system of factorial axes

Conclusions

After passing the steps in the econometric model, we can say that indirect allocations budget influence the number of students in Romanian universities, but by far the increase in these allowances will not solve the problem of financing the education that is increasingly visible. This analysis started from the need to find new ways of stimulating higher education in Romania, and not only, but it does not want to be a complete model that would provide a universally valid solution. We try through different analyzes to find answers that can be helpful in making responsible high-level decisions.

The problem of financing education as a whole, but especially of higher education, brings to light countless dilemmas faced by decision makers in this field. Even if there are countless studies, proven by specialist analysis, we still have not found a universally valid formula that provides us with the highest level of education with the lowest cost. This is not possible because universities and the state are the result of several factors joining in all socio-economic areas. On the other hand, the individual, as the main beneficiary of education, is often irrational in making educational decisions.

This combination of factors makes the funding higher education a topical subject that we will try to surprise in future studies.

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Appendix

Table 1. The database on which the analysis was performed

The level of financing of state universities in Romania in 2016

Name_of_university	Numar_of_students	thousands lei	thousands lei	lei
		University_bas sic_financing	Transport_bud get_allocations	Value_merit_ scholarship
Univ_Politehnica_Buc	28931	123197	2933	450
Univ_Teh_Constructii_Buc	5855	20197	503	413
Univ_Ion_Mincu_Buc	2885	8819	0	450
USAMV_Buc	12469	32335	763	750
Univ_Bucuresti	31388	77847	2390	400
UMF_Carol_Davila_Buc	11610	54850	656	293
ASE_Buc	21975	40271	1490	530
Univ_de_Muzica_Buc	877	10415	91	230
Univ_de_Arte_Buc	1486	8142	117	428
UNATC_Caragiale_Buc	827	11226	79	400
UNEFS_Buc	1508	4927	103	500
SNSPA_Buc	5792	12801	469	400
Univ_1dec1918_Alba_Iulia	4096	8876	109	450
Univ_Aurev_Vlaicu_Arad	5697	9597	96	767
Univ_Vasile_Alexandri	4906	14287	122	222
Univ_Transilvania	18904	59854	1033	370
Univ_Tehnica_Cluj	19871	76733	1695	350
USAMV_Cluj	5858	21880	543	300
Univ_Babes_Bolyai	35596	106183	2548	400
UMF_Iuliu_Hatieganu	7083	29503	405	251
Academ_Muz_Gh_Dima	1084	9518	76	350
Univ_Arta_Cluj	944	5744	81	260
Univ_Ovidius	14198	32509	385	330
Univ_Maritima	5013	3840	47	240
Univ_Craiova	17582	55269	711	280
UMF_Craiova	4303	19539	131	300
Univ_Dunarea_de_Jos	11752	48035	644	341
Univ_Teh_Gh_Asachi	13578	61175	1213	438
USAMV_Ion_Ionescu_Brad	4616	16560	343	400
Univ_Al_I_Cuza	23044	68465	1642	460
UMF_GR_T_Popa	9602	35310	414	300
Univ_George_Enescu	1520	13613	126	300
Univ_Oradea	14152	40693	472	350
Univ_Petrosani	3248	9824	0	341
Univ_Pitesti	9430	16241	145	250
Univ_Petrol_Gaze	7401	14979	156	275

Name_of_university	Numar_of_student	thousands lei	thousands lei	lei
		University_basic_financing	Transport_budget_allocations	Value_merit_scholarship
Univ_Eftimie_Murgu	1585	4964	52	300
Univ_Lucian_Blaga	14135	36454	323	348
Univ_Stefan_cel_Mare	7708	21256	202	493
Univ_Valahia	5854	16209	157	400
Univ_Ct_Brancusi	2921	5643	67	400
Univ_Petru_Maior	3039	7436	120	280
UMF_Tg_Mures	5555	30074	183	270
Univ_Arte_Tg_Mures	403	7154	20	250
Univ_Politehnica_Tim	12470	52275	958	292
USAMV_Rregele_Mihai	4755	16612	340	400
Univ_de_Vest	14566	39461	933	270
UMF_Victor_Babes	7080	29424	329	280

Source: www.cnfis.ro (Annual public report - 2016. State of funding for higher education and optimization measures to be imposed, 2017)

DEVELOPMENT AND USE PLANS BARRACKS - REQUIRES IN MANAGEMENT PROGRAMS AND PROJECTS IN INFRASTRUCTURE

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Abstract:

The inclusion of our country among NATO member countries has led to the restructuring and reshaping of the Romanian Army, starting with the abolition of the compulsory military service and the establishment of a professional army, leading to the modification of the functional requirements that the barracks infrastructure must respond to for the smooth functioning of the deployed structures. In this respect, a new conceptual approach is needed to bring about the systemic reconfiguration of all elements of infrastructure in order to provide the necessary facilities military structures. The management of infrastructure programs and projects describes the procedures and mechanisms for the implementation of the barracks' infrastructure use and development plans and are designed to help structures avoid ad hoc or fragmentary infrastructure planning that they use or manage.

Keywords: *infrastructure; project and program management; military structures; planning.*

Introduction

National Defense Programming Documents, including the *National Defense Strategy* (2015), the *Military Strategy of Romania* (2016) and the *Armed Forces Transformation Strategy* (2007), aim at securing national defense by developing an optimal defense capability and aiming at the modernization of the military infrastructure, improving defense resource management methods and practices, improving the efficiency of the planning, programming, budgeting and evaluation system, reducing the size of the forces, moving from threat-based planning to capability-based planning. As regards infrastructure, these documents aim at:

- the standardization of the infrastructure of large units and units of the same type in order to assure the teaching and training of forces;
- developing the necessary infrastructure to dismantle Allied forces and re-positioning the Allied states;
- correlation of military infrastructure with missions, force structure and military capabilities development process;
- providing the necessary facilities to restore the fighting capacity of personnel of their own and / or allied forces;
- ensuring the support of the host nation for foreign armed forces in transit, stationing or carrying out operations on Romanian territory;
- jointly using inter-institutional training facilities and building a training area for urban combat;
- the establishment of military bases and the development of the housing fund for the military.

Defense planning requires integrated defense resources management tailored to actions focused on the objectives regarding reorganization of the country's defense capability, such as: development of infrastructure elements to provide dislocation, stationary and training

capabilities for national and allied forces; developing an integrated anti-missile defense system based on detection and interception capabilities; restructuring, efficiency and cost-effectiveness of the national security industry.

Management of infrastructure programs and projects

The process of continuous transformation of the army as a power tool keeps its conservative character aside, and on the other it gives it a prospective one. Among the determining factors of the transformation of the armies are:

- emergence of new forms of security challenges;
- new military technologies;
- new tactics and strategies;
- the need to respond to social constraints (democratic rights, war laws, etc.);
- trying to gain an advance in front of your opponent/enemy/partner;
- combining new structures, methods, techniques and technologies in the response that the military instrument gives to security challenges (civil-military cooperation – CIMIC, PSYOPS, etc.).

The army, as a power tool, is in a continuous dynamic. The transformation process is accompanied by distinctive features of mobility and flexibility. Abandoning old security policies is now, more than ever, essential in rethinking defense strategies. Consequently, it is imperative to intervene not only within the special areas (barracks) but also in their tangential points to the "external environment", that is to say, at their limits, which require essential changes. Therefore, it is obvious that there is a need to rethink specially designated spaces, both in terms of defining and categorizing these categories into a particular typology, and from the perspective of their use and operation in a specific landscape.

Not to mention today the army referring to the physical boundaries of space, but to a defense concept that involves the integration and adaptation of the spaces for the preparation and development of the domain to the new needs of society.

Significant restructuring of defense systems over the past two decades is a global feature of the international security environment, but it also includes certain attributes specific to Romania as to the causes that triggered it, including:

- the Army reform imposed by the conditions of Romania's accession to the EU and NATO, which continues at present under the Armed Transformation Strategy (2007) and focuses on the integrated management of defense resources;
- the abolition, as of 2006, of compulsory military service by young people, resulting in a decrease in the number of military personnel;
- the fiscal and financial policies assumed by various governance programs, which have changed substantially from four to four years, have also had the consequence of reducing the state budget allocated to the MApN to a much lower value (1.42% of GDP in 2014) to make it possible to ensure the minimum necessary to maintain the infrastructure at a satisfactory level.

The restructuring and modernization process of the Romanian Armed Forces, carried out in order to align with Euro-Atlantic structures, led to the reduction of military personnel from approximately 350,000 people in the period when military service was compulsory, to about 90,000 at present.

This restructuring has naturally resulted in a reduction in the number of operational armed barracks of the armed forces, as well as the personnel that administers, manages and maintains them.

The issue of these barracks, which exceeded the needs of the army, was addressed in 2007 by initiating the process of transferring a number of dismantled barracks from the administration of military structures in the administration of specialized structures of domains and infrastructures. The purpose of the action was to relieve the military fighting structures from the task of managing the dismantled barracks and concentrating them exclusively on the

active barracks, as the restructuring process led to the diminution of the administrative personnel (administration formations) of the military structures.

It has also been envisaged that the specialized structures of the defense system will establish a judicious program for the preservation of these barracks and will provide the premises for their valorization in the forms allowed by the legal framework in force. In this respect, these structures have been given the following tasks:

- managing, preserving and maintaining dismantled barracks;
- assessing the potential of barracks that have become available, in order to change destination, capitalize on law or conversion;
- identification of means of capitalization, according to the law, in their medium and long term.

In this respect, a new conceptual approach is needed to reconfigure all the infrastructure elements in order to provide the necessary facilities for the accommodation, training, recreation of their own and / or allied forces, taking into account both the new operational requirements of the deployed forces, as well as the fact that the existing infrastructure is obsolete, and the maintenance and operating expenses involve the allocation of important financial funds. The infrastructure of the real estate patrimony is a good belonging to the public domain of the state and provides the basis for the construction of accommodation facilities and training activities of the military structures.

The management of infrastructure programs and projects describes the procedures and mechanisms for realizing the plans for the use and development of the real estate patrimony. These tools are essential and are designed to help structures avoid ad hoc or fragmentary infrastructure planning that they use or manage.

The management of infrastructure programs and projects provides guidance on how to prepare use and development plans. In essence, these plans take into account how a barracks or barracks groups should develop over a period of up to 15-20 years. Infrastructure use and development plans (PUD) for infrastructure are produced to support development decisions in a rational way and are essential tools for rationalizing patrimony and provide a broad insight into the future use of existing land, buildings and facilities, taking into account future requirements that may be included in the infrastructure.

The management of infrastructure programs and projects explains:

- the value of a plan of use and development;
- the main components of the use and development plan,
- the factors involved in producing a plan of use and development;
- the actions required to implement, monitor and revise a plan for use and development.

Real estate patrimony faces a number of challenges and opportunities in the coming years. All clues show that depending on how it is argued, infrastructure development will become more and more important. Challenges and opportunities include:

- real estate management;
- reviewing defense policy;
- the use of public-public partnerships or private financing initiatives (PPPs/PFIs);
- Sustainable development of infrastructure
- public spending accountability;
- recruiting and maintaining staff, increasing the quality of life;
- security;
- the need to increase cooperation between services for the structures.

Use and development plans are valuable tools for program directors because of the help they provide in performing functions, assisting command-line communication and conflict resolution, and will include a long-term infrastructure work program (15 years) that contains all current and planned projects that need to be implemented during this time period. This should be the basis for program managers for long-term training of infrastructure costs.

Also, the use and development plans provide a program to be followed for most of the new works, which must be taken into account when planning budgeting and programming of current repairs, investments or capital repairs.

The defense strategy raises fundamental questions, which will eventually impact on program directors and implicitly on facilities within the infrastructure:

- what happens to the infrastructure that has become available as a result of the restructuring process that the structures go through?
- what are the operational needs and other requirements that will need to be planned?
- how and where will these needs be met?
- is it necessary an extension of the infrastructure?
- is it necessary to shut down or rationalize the infrastructure?

Use and development plans provide a means to help:

- determining the existing capacity and the potential of the infrastructure to meet operational needs;
- establishing a logical and robust framework in which decisions can be made on the rationalization of barracks and the alienation of land;
- identifying cost-cutting opportunities through more efficient use of land and buildings.

Identifying long-term operational requirements and means to materialize offers the advantage of lasting infrastructure implications and ensures that barracks are efficiently used and cost savings.

Budget planning structures based on use and development plans will be able to make and present better informed decisions about spending priorities by focusing on consumed resources and not just on spent cash, treating current expenses and capital in a way that better reflect their economic significance and encourage discipline with greater emphasis on results and achievement of goals and objectives. Resource accounting and budgeting will have an impact on real estate, particularly in balancing operational needs with the opportunity to maintain land and buildings. Use and development plans will play a key role in helping to plan infrastructure in this new context.

There is growing interest in the consequences of development in terms of impacts on people and the environment. This concern leads to the analysis of proposals to assess whether or not they constitute sustainable development.

Real estate patrimony is usually developed within localities; it can make a significant contribution to the local economy and the vitality of the community; it can also have a positive impact contributing to the quality of the environment. A use and development plan can demonstrate the positive development benefits of establishing, for example, the reuse of abandoned land or reorganizing the use of a location. The use and development plan also provides a mechanism by which negative effects can be identified and minimized or avoided. There will always be a need to balance operational requirements with sustainable development considerations.

Capital works projects must be planned and developed as part of a long-term official development plan to ensure efficient land use and are considered as alternative land use options. Elaboration of the use and development plan is clearly correlated with them. Plans can provide the framework in which future project expenditure and ongoing repairs can be identified and justified.

There is a growing awareness of the need to provide staff and their family members with a reasonable quality of life for recruitment and retention. The use and development plan provides a mechanism whereby such issues can be reviewed in a systematic manner and identifying opportunities for improving the quality of life. A key aspect of the use and development plan is that it does not only take into account the existing situation but forecasts the future as the number of staff and their needs can change and so the plan can be used to justify expenditures designed to improve the quality of life and, ultimately, could help keep staff in work.

Use and development plans must be regarded as living documents. The broad strategy of a plan may take several years to achieve its goals, but it is important that no major

development or change is allowed over time that could undermine this strategy, except in the event of a justified violation from the initial plan. For example, land allocated for the long-term expansion of a particular activity should be retained for this purpose; this approach is not always valid at present, unless there is a good reason to do so.

The key to successful implementation of the plan is the right to use and administer. If the plan is designed and implemented by a particular person, there is a danger that the plan will be forgotten as the person moves elsewhere. Forming a group to design and track its implementation, using the plan as a project management tool, is a further way of ensuring that the document achieves its goals for which it was conceived. The composition of the group will vary according to the specific circumstances. The group could include the staff who dealt with the plan or an existing group, which is in charge of coordinating the implementation of the plan and who may be entrusted with the implementation supervision. The composition of the group must be able to resolve the conflicts that will arise and be broad enough to accommodate the main structures deployed in those barracks. All staff must be kept abreast of the use and development plan and should therefore be disseminated as widely as possible to all structures with implications for its development and implementation.

Conclusions

Utilization and development plans make a significant contribution to meeting the challenges and opportunities faced by real estate. The considerations presented will also influence the scope and content of the next generation of use and development plans, reflecting best practice in land use and construction planning.

Part of the military structures barracks were set up outside the area of development of the localities, without the simultaneous danger of disturbing the activities. Along with the urban development of the localities there was and is the prerequisite for the inclusion of the barracks in the general or zonal urbanization plans, which leads to a new approach to the provision of facilities for the structures through a remodeling of the existing infrastructure.

Changes in the security environment as well as requirements, doctrine, management and new technologies lead to a constant requirement for changes in the real estate patrimony.

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The publications consists of 360 pages.

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