

SPECIFIC APPROACHES TO AUGMENTING LOGISTICS PLANNING IN JOINT MULTINATIONAL OPERATIONS

Gheorghe MINCULETE

“Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania
minculetegh@yahoo.com

Abstract: *Challenges and actions by state adversaries in the economic-social and military domains at the regional and global levels necessitate a more detailed approach to combat power at the operational level of NATO. This concept refers to the availability of the necessary logistical capabilities, as well as the leadership's skills and willingness to use them effectively and efficiently on operational components and functions in the area/theater of joint multinational operations. In this paper, I highlight the appropriate elements for augmenting the logistics planning of joint multinational operations, the primary role of tailored support following the new requirements revealed by the lessons identified in the armed conflict in Ukraine. The sequences and subsections developed in the material present an approach and correlation necessary for increasing the role of logistical planning in joint multinational operations to provide timely support with sufficient resources to the organized, engaged, and led multinational joint forces in achieving operational objectives and the end state.*

Keywords: operations, multinational, joint, planning, procedures, logistic, support

1. Introduction

Logistical support for multinational joint operations represents a primary facilitator of operations and a major component of combat potential at all levels of command, frequently shaping the design of operations. Here, leadership and/or executive personnel from the logistical structures are involved to act proactively and anticipatively to ensure and develop the necessary logistical capabilities in the multinational theater of operations, under appropriate conditions of resilience and risk management, to support the action efforts of tactical and joint forces in fulfilling received missions and achieving the end state. The mechanism of multinational joint logistical support, which integrates the national efforts of TCNs and theater-level common logistics support, includes the appropriate planning activities

specified in CONOPS/OPLAN regarding: equipment and materials; services; logistics information management; maintenance and repairs; movement and transportation; RSOM support; logistics engineering; operational medical support; contractor support for operations (CSO), and HNS [1]. Furthermore, I highlight several sequential aspects of planning for multinational joint operations, according to the specificity of each stage included in this process, namely: *initiation of planning; mission analysis; development of potential courses of action; analysis of courses of action; comparison of courses of action; selection of the optimal course of action and its approval by the commander, and development of the operation plan* [2, 3] (Figure 1). The process from mission analysis to selecting a

course of action and its approval by the commander of the multinational joint force

is known as *operational estimation*.

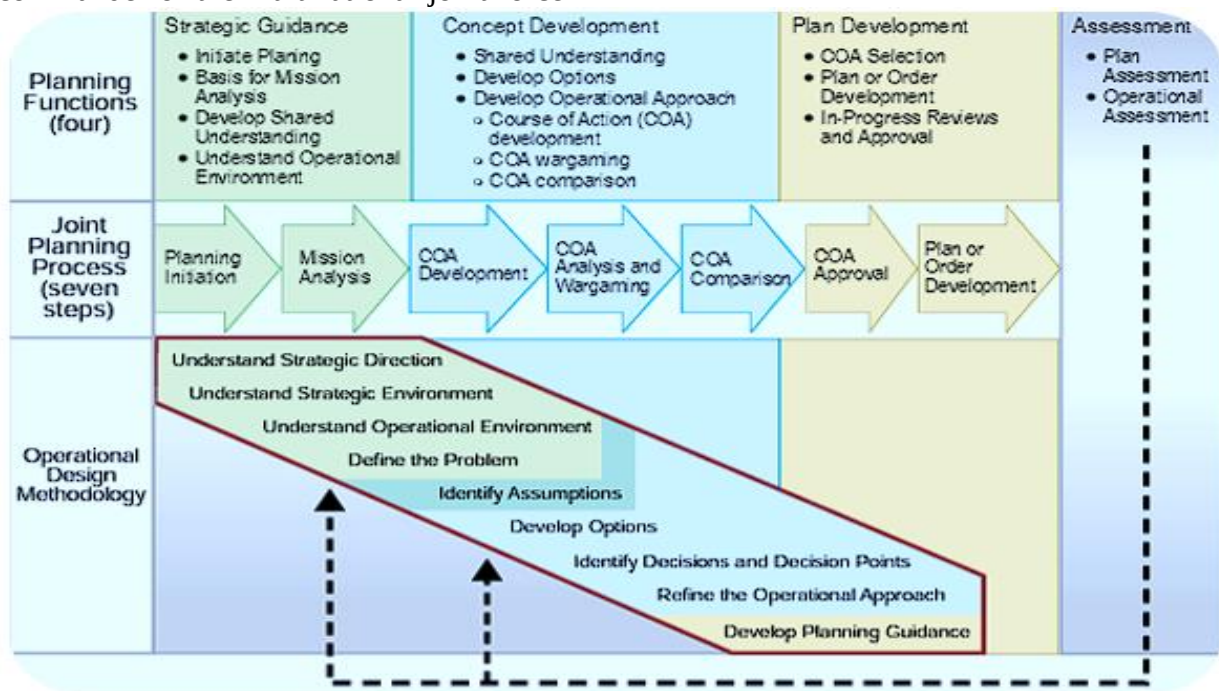


Figure 1: Stages of Multinational Joint Operational Planning

Source: Joint Publication (JP) 5-0, Joint Planning, 01 December 2020, 3-4

As a rule, the planning process is initiated through a directive, which can be issued by a national government, a defense department, or the North Atlantic Council (NAC) - for an operation led by a NATO command. The directive can be clear and precise, but it can also be formulated in insufficiently defined terms. In the next stage, mission analysis, planning groups at the joint and tactical levels, including logisticians, will assess several factors considered to meet the requirements of multinational logistic support, suitable for each course of action to be developed. Also in this stage - depending on the ultimate goal of the mission, the roles of the joint force structures that could be involved in the execution of the courses of action, the support requirements in the established logistic support lines, the identified constraints, and risks - the logisticians will collaboratively and anticipatively clarify the forces, logistic support means, and specific activities that need to be carried out in support areas, in accordance with the requirements of the multinational combat forces located at the joint and tactical

operational levels. These implications will differ significantly, depending on the phases of the mission and the commander's intent. For example, a peace enforcement or combat mission will generate significantly different logistical support challenges and actions compared to a mission specific to humanitarian assistance [5].

After analyzing the mission, a commander at the joint or tactical level will issue instructions to the subordinate planning staff to begin developing potential courses of action. Depending on the level of engagement and the complexity of the multinational operational problem, planning teams will be formed, including logisticians from the J4 logistic module and/or from the G4 and S4 tactical logistic modules (G4/D, S4/Bg, R, and S4/B; A4/FA; N4/FN). Each COA will be assessed (evaluated and quantified) in the sequential dynamics of development regarding the real, effective, efficient, and resilient potential of certain support (logistics) in accordance with the specific and effective resources and potential of the respective logistic support line. Furthermore, each COA will need to

be validated by testing the response to requirements in relation to the logistic functions that need to be implemented under restrictive and difficult operational conditions, to be evaluated. probable results, strengths, potential weaknesses, as well as possible risks. If logistic planners can identify and articulate adequately, in a perspicacious manner, the logistic risks during the construction and validation of COA, then their contribution would be valuable in the process of comparing them, thus helping joint and tactical level commanders make relevant selection decisions. Once the commander has selected the best COA, the decision will initiate the development of the operation's concept, which will be the subject of elaborating the OPLAN (being included in the document). The operation's concept essentially represents the commander's vision for the operation and how it will be put into practice - based on the selected COA. The multinational joint operations plan and the OPLANs of the tactical combatant structures (from the joint force) will include all the necessary implementation details by transforming them into OPORDs [5].

For the construction of this scientific material, I followed the following steps:

- Setting the research objectives:* identifying and defining the main objectives of the research; analyzing the “4 D” method (*Demand, Destination, Distance, Duration*) in the planning and execution of multinational joint operations; evaluating the importance and impact of the “4 D” on the logistics of multinational military operations; examining the logistical challenges and lessons learned from recent military operations, such as the Russian invasion of Ukraine.

- Identifying sources:* searching for and identifying relevant sources of information, including scientific articles, reports, books, and other specialized documents in the field of military logistics and multinational operations; consulting reliable and up-to-

date sources to obtain precise data and accurate information; synthesizing and integrating relevant information into the scientific material;

- Identifying, analyzing, and comparing information:* identifying and extracting relevant information for the research topic from the selected sources; critically analyzing the information to evaluate the importance and applicability of the “4 D” method in the context of multinational operations logistics;

- Comparing data and findings from different sources to obtain a comprehensive understanding of the subject.*

- Creating appropriate content:* structuring the scientific material coherently and logically, using clear sections and subsections to organize the information; drafting clear and concise content using appropriate academic language; including concrete examples and relevant data to support the arguments presented; correcting and revising the material to ensure coherence, accuracy, and overall document quality.

These steps have contributed to the construction of a well-structured and informative scientific material about the “4 D” method in the planning and execution of multinational operations in the field of military logistics.

2. The “4 Ds” Method

To ensure the requested actions are carried out within the specified parameters, logistics managers will train their subordinate logisticians on the issues related to developing courses of action, as well as their validation and comparison. There are many ways to proceed in this regard, but one of the most accessible to consider is the “4 Ds” method: *Demand, Destination, Distance, Duration* (Figure 2). Below, we will present details of interest for the stages of logistical planning in multinational joint operations, at the joint and tactical levels.

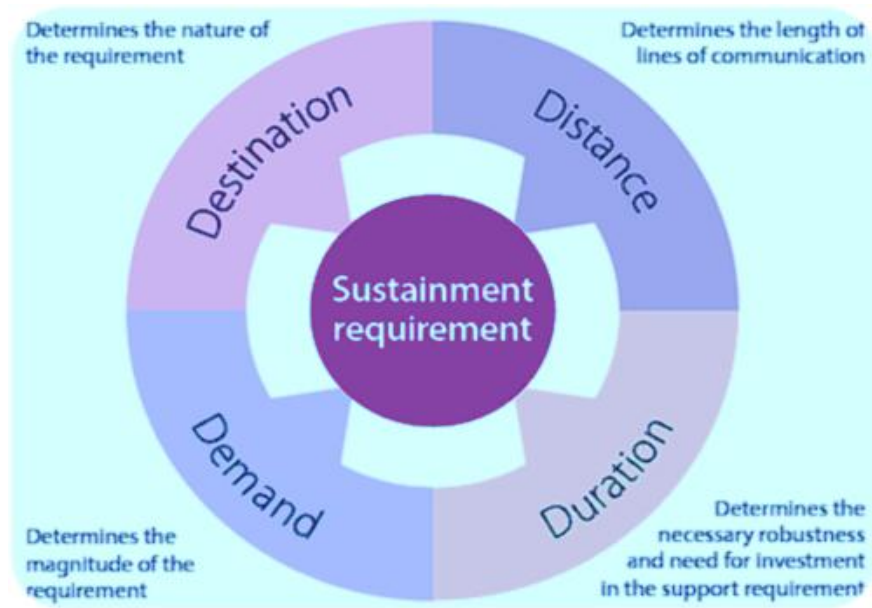


Figure 2: The Role of the “4 Ds” in Specific Logistic Planning for Multinational Joint Operations

Source: The Development, Concepts, and Doctrine Centre, Joint Doctrine Publication (JDP) 4-00. Logistics for Joint Operations, Ministry of Defence, UK, July 2015, 156

•Demand

In the process of planning the logistics of multinational operations, during the phases of development, validation, and comparison of COAs (Courses of Action), logistics planners focus on establishing the most suitable Demand for goods (equipment and materials from classes I-V/NATO) and services, as well as their positioning in the military supply-delivery chain to the relevant structures that receive, maintain stocks, and distribute goods, such as: theatre logistics bases (TLB); forward operational bases (FOB) [8]; depots of logistic support structures from the logistic support lines, etc.

Conceptually, a Forward Operating Base (FOB) represents any secured operational military position (usually located within a locality within the AO) and used as a crucial operational center to project and conduct subsequent offensive and/or defensive actions (operations). Benefitting from logistic support in the planned main operations, FOBs may or may not include (each) a hospital, an airfield, or a repair shop. The selection and use of FOBs are operational elements of interest for

both the JTF command and subordinate commands [9].

Multinational joint and tactical operations of high intensity can involve a significant consumption of ammunition. In this regard, even though the initial supply is substantial, regular replenishment of the theater may be necessary to support multinational joint operations. For the movement of multinational combat forces between the national territory of each TCN and the theater of operations, as well as within it, logisticians will anticipate that the resupply of ammunition will be carefully prioritized in accordance with the specific provisions of the RSOM&I process and the requirements of the operational phases where the combat and support structures are integrated, after the joint and tactical integration in the multinational joint theater of operations. At the same time, the proactive conduct of leadership and execution logisticians will focus on the planning and timely and protected execution of appropriate actions for [5]:

✓ Protecting food, fuel, and ammunition stocks against extreme temperatures and

adverse conditions, including high levels of dust;

- ✓ Storing all materials from classes I-V under the required storage parameters (in wheeled, tracked vehicles, and on the ground), inspecting and eliminating non-compliant situations throughout the preparation and conduct of operations;

- ✓ Interchangeability of food, fuel, and ammunition among NATO allies in case of excessive consumption resulting from the intensity of hostile actions, interruption of the supply chain, etc.;

- ✓ Supporting the livelihoods of deployed troops, structures of other nations under the command or administration of own forces, public service personnel, civilians providing support to the selected contractor(s) for operations support, locally hired civilians;

- ✓ Ensuring the fuels, oils, and lubricants needed for the conduct of expeditionary operations that require maneuvers over extensive distances and varied terrain, as well as in (potentially) extreme weather conditions;

- ✓ Historical analysis of the consumption and availability of resources necessary for the components of the joint force (maritime, land, air, etc.) to ensure adequate requirements in priming equipment packages (PEP), deployable spare parts packages, etc., to enable them to function satisfactorily until the logistic channels of the supply-delivery chains are established and operational within the logistic support lines in the theater and between them;

- ✓ Supporting prisoners of war (feeding, equipping, accommodating) in the event they are captured;

- ✓ Providing the infrastructure needed by original equipment manufacturers (OEMs) or other contractors moving into the theater to perform preventive maintenance (PM) and other activities.

Among the requested services will be MRO (Maintenance, Repair, and Operations), considering that some of these will be carried out in the multinational joint theater of operations and others at the residence

location of the respective combat structure (integrated into the joint or tactical device) or in an intermediate location in the maintenance support chain. Maintenance professionals often refer to maintenance, repairs, and inspections when using the term Maintenance, Repair, and Operations (MRO). Examples of MRO items include industrial equipment (e.g., pumps, engines, belts); consumables (e.g., cleaning supplies, office supplies); maintenance consumables (e.g., lubricants, gaskets, repair tools). MRO can include hundreds of subcategories involving materials for the supply-delivery chain. Maintenance professionals use MRO items to keep an organization's structures, equipment, and assets functional - including military ones. MRO-related acquisitions include maintenance tools and equipment, spare parts for production equipment, personal protective equipment (e.g., safety glasses, work gloves), and office supplies [10].

The demand for materials needed for maintenance activities for maintenance and repairs (involving spare parts, components, consumables) is easier to forecast for preventive maintenance - because it is scheduled, compared to corrective maintenance - which is inherently less predictable. The demand for individual equipment needed by soldiers, protective helmets, individual weapons must also be calculated and planned. At the same time, the demand for all levels of operational medical assistance must be covered. Here, it will be considered that it is unlikely that the "population" from which victims will be drawn will consist only of personnel engaged in multinational joint and tactical operations; it will also include contractors, wounded enemy personnel, and civilians caught in conflict. Victims will include not only those who have been injured but also those affected by illness and injuries that were not sustained during combat. Furthermore, in addition to all these, the demand for all equipment and materials from the NATO supply classes and for all relevant services may be significantly

affected by the environment in which operations are conducted.

Therefore, logistics operational planners should assess how the demand is affected by considering the Destination, for example, the extent to which the terrain could accelerate the wear and tear of systems, compressing the time between scheduled maintenance activities, or the extent to which heat or cold will affect

water and fuel consumption. An important reality of military campaigns in Afghanistan was the seasonal nature of enemy operations, reflecting key weather characteristics. The Taliban were more active during the “campaign season” in the warmer months of spring and summer. What matters to logisticians are the implications of seasonal operational engagements on demand.

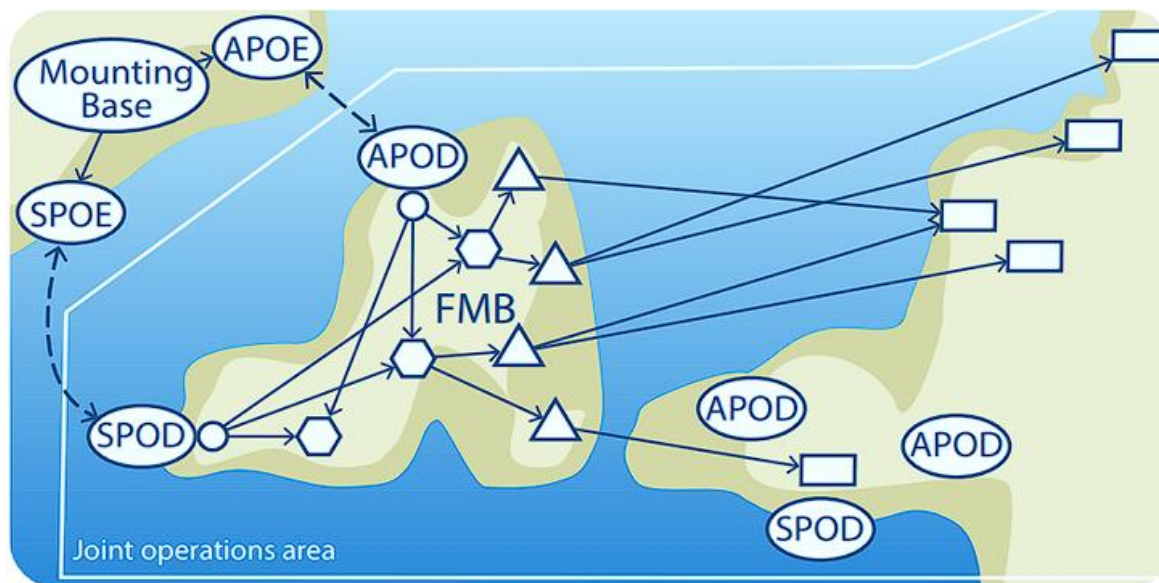


Figure 3: Deployment of a TCN Force via a Forward Assembly Base (FMB)

Source: The Development, Concepts and Doctrine Centre, Joint Doctrine Note (JDN) 1/17. Joint Theatre Entry. Ministry of Defence, UK, 2017, 28-29

Legenda

APOD	air port of disembarkation	RPOD	rail port of disembarkation
APOE	air port of embarkation	RRA	road reception area
△	assembly areas	SPOD	sea port of disembarkation
□	deployed force(s)	SPOE	sea port of embarkation
FMB	forward mounting base	○	staging areas
○	marshalling areas		

•Destination

An evaluation of the Destination should primarily focus on the country or region where the multinational operational mission will take place. However, it may also be necessary to expand the area of reference to include neighboring states or geographic features that cross borders. I consider four situations - a), b1/b), b2/b), b3/b) - where, for each, there are directions with different

logistical challenges for:

- Continuing the movement of the force in the multinational joint operational theater - by land, air, and sea transport - from the Staging Area (SA) to the joint operational area within the composition,
- Achieving material resupply through wheeled and tracked vehicle transportation in the operational area/theater of operations,

as follows:

b1) From the depots of a theater logistics base (TLB) to the depots of a division/ground component/multinational joint force - corps level;

b2) From the depots of a mechanized infantry brigade to the depots of a subordinate maneuver battalion;

b3) From the depots of a mechanized infantry battalion to the combat service support area of a company from the organic unit acting on an independent axis [5].

Logistics planners will need to assess, for each situation presented, the area of interest of each direction to obtain information and data regarding: physical characteristics; general geographical elements; terrain features in certain regions (segments) or at some points of considerable importance. These details can be significant because, for example, they can reveal axes of advance (from rear to front), supply routes, and even potential defiles and blockages. The weather in the target areas may also be important for logistics planners. Weather can enable or disable vehicle movement, restrict the flight capacity of helicopters and fixed-wing aircraft, and can have a detrimental effect on stocks and personnel, all of which can have immediate logistical implications. If there is a support pattern based on operational complexity, this can lead to the identification of predictable periods of intensive activity, followed by periods of relative calm. Logically, the demand for logistical resources is greater and very high during major responses to adverse actions than during others.

From a functional perspective, the Destination should also include the general structure and infrastructure of the areas of interest. These should include roads and railways, airports and seaports, the capacity and range of power generation and distribution, water supply, and drainage, as well as agriculture, production capacity, and service industries. Joint-level logistics planners will want to assess and measure the extent to which logistics resources and

capabilities can be obtained in the theater through HNS, as well as the extent to which these resources can be made available to the troops in a timely manner to fulfill their assigned missions. Also, the cultural characteristics, political inclinations, and general attitudes of the population in the state where hostilities have occurred or will occur should be taken into account. This leads to potential possibilities concerning: the sources of civilian employment locally engaged to intervene in augmenting the logistical support of tactical organizations; the potential for cooperation in providing goods and services in the multinational joint operational theater to be delivered to military beneficiaries within the logistic support lines.

•Distance

Considering the Distance, both external distances and those within the multinational joint operational theater of operations will be taken into account. For logisticians assigned to multinational combat structures, Distance generally has the same significance as for logisticians in the commercial sphere, as the length of the logistical channels depends on it - for the direct and reverse flows of equipment, materials, information, and data - integrated into the military supply chains (SC) in the logistic support lines of the theater. To carry out operations within the logistical channels/SC shown, the command and execution structures of logistical support will plan and move the transport columns (means) (according to established modes of transport) on suitable supply-replenishment routes (land, air, maritime) - of varying lengths - to the joint and tactical forces, to make up for deficiencies (in equipment and consumable and non-consumable materials) in the operational areas where they will act. In the case of goods transportation by a TCN from the national support base to the multinational operational theater, the length of the external distance determines the configuration of the logistical channels

within the specific supply-delivery chain. The longer the latter, the greater the volume of inventory that will move along it, in transit. A key aspect for planning logisticians is the delivery periods of goods, that is: the times required and opportunities for the items (equipment and/or materials) to effectively reach the large units, units, or subunits that requested them. If, according to the configuration of a multinational joint operation to be conducted, the distances are greater, then the delivery times are longer, which will increase the likelihood of logistical actions to speed up the delivery of critical goods by other means [5].

The reverse flows of immobilized (damaged) equipment, which will be moved back to a maintenance base (center) or to another upstream location, will also be affected by the Distance. In simple terms, the greater the upstream distance these goods have to travel to reach a maintenance, repair, and overhaul (MRO) capability from depth, the lower the required levels of availability of vehicles, helicopters, and other technical systems evacuated for medium and/or major repairs. In addition, ensuring timely provision of human and material resources necessary for repairs, such as mechanics, engines, gearboxes, auxiliary power units, spare parts, etc. Where the distance between the national territory of a TCN and the multinational operational theater is significant, an advanced mounting base (forward mounting base - FMB) [8] could be installed and used to prepare for entry into the theater, where the RSOM process could be carried out to reduce the associated displacement period. The FMB is a base, most often a port, airfield, or railway terminal, from which an operation in a JOA can be launched. It is usually within SACEUR's area of responsibility but not necessarily within the JOA. An FMB must be secured and not directly exposed to the risks of enemy action. Essential for a JOA, an FMB must have the capability to facilitate the formation of an insertion force

in the multinational joint operational area and to form it, as well as the potential to provide the resources needed for reinforcements, reserves, and evacuations. The selection, formation, and location of the FMB represent a strategic objective for SACEUR, which also considers the concept or advises the JTF commander.

It is important to note that an FMB will be used as a triage area for personnel, vehicles, weapons systems, other equipment, and materials being moved to enter the theater, including a (location) working point for the recovery of those immobilized, to return them to the national base of origin. Here, even a Level 3 medical treatment capability (FMT ROL 3) could be installed. In conditions of extreme heat, combatant personnel can be acclimatized in an organized manner at the FMB before entering the theater and integrating into the established operational zones (bands). Also, in an FMB, which allows for safer accumulation of goods in the face of enemy threat, there may be an opportunity to perform any engineering maintenance work on aircraft, ships, vehicles, weapon systems, etc. Vehicles, weapon systems, materials, and personnel will move in stages (according to established flows) within and outside the theater from the FMB [11].

With the coordinating authority it holds, the JTF commander will act to facilitate the arrival (in the relocation process) of multinational joint forces in the JOA to implement his intention. In this sense, the selection, establishment, and preparation of PODs and FMBs will be carried out before the relocation of the main elements of the mentioned joint force. Also, to ensure the proper level of reception at PODs and/or FMBs, the early deployment of advanced logistical resources is essential so that the efficient movement of combat structures (of TCNs) in the multinational joint operational theater can be achieved [8]. Figure 3 shows a generic FMB arranged in the field at a considerable distance from the multinational joint operational area/theater of operations.

•Duration

The duration of a multinational joint theater of operations mission is determined by the length of the operation(s) to be conducted within a certain period of time. If the planned mission is of short duration, it involves a series of support limitations in the theater of operations, including: investments in necessary infrastructure; establishing temporary arrangements for obtaining the required resources through contractors, which may divert resources to other tasks considered more pressing or of longer duration; inadequate attention from the entities and structures responsible for providing the necessary resources to support the mission; the use of strategic airlift - to expedite the delivery of spare parts and critical materials - rather than investing in storage support systems for a longer period, which will incur additional costs; at the end of the mission, the equipment and materials of each TCN force will be moved along with the troops to their countries of origin [13], and so on.

In the event that the mission in the multinational theater of operations is of long duration, this allows for the exploitation of more opportunities, but also requires increased support efforts, such as: making investments in justified solutions that have longevity, offer economies of scale, and facilitate support process efficiency; the rotation of combat structures belonging to the TCNs presents logistical challenges associated with RSOM for units arriving in the theater and vice versa for those departing. The number of troops and, consequently, the demand for food, water, ammunition, accommodation, transportation, and campaign services will increase in the event of an overlap of the presence period in the theater of units leaving with the units arriving; the equipment and materials required for a mission period (usually 6 months, with the possibility of returning after 12 months) will remain in the theater to be used and consumed by the unit replacing the one that

has completed its mission. For this purpose, anticipatory planning and implementation (or procurement) activities will need to be carried out for the establishment of storage spaces and the procurement (supply-replenishment) of resources (goods and services) necessary for the maintenance (feeding, equipping, housing, etc.) of personnel, the functioning and maintenance of the equipment of each TCN for the duration of each mission, as well as ensuring the existence in the theater of additional equipment and related consumables to prevent any operational risks [5].

After the integration of combat forces into multinational joint operations zones (as the final phase of the RSOM&I process), the actions of combat forces will be carried out according to the durations of the planned operational phases. This will require a logistical effort overlapping the action effort and, as such, the realization of additional urgent resupplies of ammunition (although the combat stocks, quantified in SDOS and CDOS, have been completed), due to increased consumption caused by the enemy's high-intensity attack [14]. The execution durations of the resupplies will depend on the requests of the recipients-beneficiaries of the equipment and/or materials to be transported (classified by urgency), the distances the goods will be moved, and the means of transportation used. For example, to urgently replenish ammunition shortages for some maneuver units, there may be situations where: ammunition under 20 mm (NBDM) can be fully provided by the relevant TCN's NSE; ammunition over 20 mm (BDM) will need to be provided approximately 50% by TLB/JLSG. Therefore, although in both situations the ammunition suppliers are located in the third line of logistic support of the area/theater of multinational joint operations, NBDM ammunition will reach military beneficiaries faster than BDM, with the following being considered comparatively: the quantities to be

transported; the number and type of transport means engaged; the handling personnel involved in loading and unloading; the enemy's actions [5], etc.

The failures in planning and executing the campaign in Ukraine by the Russian invading forces were a consequence of the inadequate integration of specific logistic support, which otherwise generated major deficiencies and consequently operational decline. Thus, a few can be listed: the inadequacy of the Russian operational logistic system with the objectives of the offensive invasion operations; the non-aligned operational logistic planning with the realities, constraints, and risk factors on the ground; inadequate logistic support, confirmed by the critical lack of essential materials such as food, fuel, and medical support, leading to the abandonment of equipment in good working order; the alarming lack of insight by the Russian tactical commanders revealed by neglecting the protection of logistic convoys consisting of unarmored vehicles, thus being systematically hit and destroyed by Ukrainian defense forces (here, the impact factors, such as sensors and unmanned aerial vehicles (UAVs), on the tactical movement of transport columns in the spaces appropriate for offensive operations, were not evaluated in time) [12;15].

3. Conclusions

Based on the presented information, the major importance of the “4 Ds” in the planning and execution of multinational

operations at the tactical and joint levels, directly dependent on integrated logistic support, is evident. At the same time, a necessary interdependence of these factors is noted, depending on the specific planning and provision of logistic support according to the requirements of the missions and objectives that need to be achieved to reach the final state by the operational components of the multinational joint force. The logistic challenges, which involved a specific relationship of the Demand-Destination-Distance-Duration factors, faced by the Russian army in the first two weeks of the invasion of Ukraine, were broadly highlighted by Lt. General Douglas Lute on “The News with Shepard Smith”/CNBC. He mainly referred to the long distances on which the movements of supplies, trucks, and logistics depend, as well as the time needed for their protection, which must represent a significant concern for the logistics forces. The same did not happen in the case of the deployment of the invading Russian attack structures, as he pointed out, especially the “heavy forces [with] a lot of armored vehicles [and] a lot of logistics consumption”, which “as they moved deeper into Ukraine, they moved even further away from the logistic bases”. All of this culminated in the blockade of that convoy of tanks and armored personnel carriers stretching about 40 miles to Kiev, due to the deficiencies manifested in the specific supply-distribution chain, which was subsequently decimated by Ukrainian defense forces.

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