LOGISTICS INFORMATION SUPPORT IN NATO-LED OPERATIONS

Miroslav PECINA and Roman DUFÉK

Abstract: In the NATO principal document „NATO Logistics Vision and Objectives 2013-2022“ is clearly stated, that logistics support capabilities are critical for many of the types of operations that NATO may undertake. It is important to improve visibility of logistics requirements and capabilities and indeed improve the overall coordination in multinational logistics. In order to support more effective and efficient management and coordination of available capabilities and resources in multinational operations, the new logistics information environment, exceeding current LOGFAS capabilities, and enabling collective planning and execution of logistics support, is needed.

Keywords: Logfas, logistic, operation, NATO.

1 Introduction
Developments in the security environment during the last 10 to 15 years and the need to deal with conventional and especially asymmetric threats and risks, wherever they occur, sets the clear requirements for development of capabilities, especially the ability to make and support multinational joint expeditionary operations at long distances, under conditions with little or no local support and to sustain forces in operations for the long period. This requires fully deployable armed forces, sustainable in operations and capable of interoperability, which can be achieved only by a fully coordinated multinational support for deployed forces.

In the area of NATO logistics planning there are however still persistent shortfalls that precludes the development of multinational logistics to be fully implemented in practice. Although nations and NATO have agreed the principal of collective responsibility for logistics for more than a decade, the practical implementation is very slow in coming.

Previous and current NATO operations have been supported by effective, but mostly independent, often uncoordinated, and potentially unnecessarily duplicative national support capabilities. Lessons identified in current operations and for the NRF clearly demonstrates that the planning and delivery of logistics continues to be primarily carried out on a national basis. Therefore further effort is needed to exploit benefits of collective logistics.

Better visibility, wider theatre level logistics authorities, and more agile and adaptive capabilities to exploit emerging technologies, amongst others, could help to achieve a more optimised logistics footprint, and thereby lead to improved effectiveness and efficiency. There is also a need for improvement of cooperation during all phases of operation (planning, preparation and execution) and among all actors (NATO, nations, International organisations, contractors, etc.).
2 The experience of the NATO operations
The experience of the past and present NATO operations confirmed the need for modern and highly capable forces - forces that are fully deployable, sustainable and interoperable, able to operate across the full spectrum of possible conflicts and crises, over a longer period of time, beyond Alliance territory, without geographical restrictions.
To be able to respond to the logistics requirements of such forces, it is necessary to improve the efficiency of logistics support and maximize the benefit of all stakeholders. Logistics capability for NATO operations must be designed to reduce the level of duplication of national resources, simplify and streamline logistics chains and NATO Commander should have sufficient visibility, authority and flexibility to fulfill operational requirements. This includes the need for timely, relevant and accurate logistics information that will enable him a greater influence on the implementation of logistics support.
Basic prerequisite for managing continuous logistical support to operating forces is a visibility of available resources, requirements and processes. Information and visibility of the logistics resources is also a prerequisite for NATO Commander to adequately exercise his authority to coordinate and prioritize logistical support.
To summarise, the NATO Commander requires timely, accurate and relevant information for effective decision making, as well as sufficient authority to make decisions on the national and multinational logistics capabilities. The key is a visibility of the logistics requirements, resources and processes. The visibility should include different levels of command and control of NATO, nations and other participants, and requested information must be provided at every level.

3 Current information environment
The need to increase visibility, transparency and efficiency resulted in requirement to develop an automated tool, which would, based on multinational common logistics databases, enable an easy identification of national units and their material and also minimize errors in reports contents and the level of effort of systems users.
Main aim of such tool is to provide NATO commanders with dynamic update of changes in key information database, including reserves and shortages of equipment and material in the possession of their subordinate units.
Based on the above requirements, NATO has developed a comprehensive suite of program systems called LOGFAS (Logistics Functional Area Services), containing the following basic systems:
- ACROSS - Allied Command Operations Resource Optimizations Software System
- ADAMS - Allied Deployment and Movement System
- EVE - Visible Effective Execution
- CORSOM - Coalition Reception Staging & Onward Movement
- LOGREP - Logistics Reporting System
These systems are based on a common internal database (LOGBASE) and use common data files and sharing tools. For an easy identifications of all items included in the database a codification scheme was established. All these systems are fielded prototypes - although they are continuously under development, they are already used by the armies of NATO member countries in operations as well as during exercises.
Using of LOGFAS systems confirmed the successful transmission of data, improvement of the quality of output information, increase the availability and usefulness of data and increased transparency and visibility of logistics capabilities. However, emerging requirements for conducting of joint expeditionary operations are exceeding the current capabilities of LOGFAS.

The current systems do not have a sufficient capacity for the required support to the logistics decision making process and the NATO Commander does not have a sufficient visibility of the available logistics resources. That is leading to missing opportunities and wasting of resources by providing additional unnecessary supplies. Another problem is the diversity of national systems and their mutual non interoperability. Existing solutions simply do not meet the requirements for managements of future joint operations; therefore development of the new information environment, based on new technologies is the only way to satisfy operational requirements.

In more details, experience from operations identified the following problems:

- Inadequate collective planning
- Inadequate coordination, synchronization and management
- Independent and uncoordinated and often unnecessarily duplicated national support systems
- Existing tools (LOGFAS) are not efficiently used
- Lack of interoperability between multiple and diverse systems and technical solutions
- Incomplete overview of available logistics capabilities and facilities
- Inadequate overview of available resources and logistics requirements, resulting in missing opportunities and unnecessary waste of resources
- Insufficient support to decision-making processes

This deficiencies lead to the fact, that NATO commander has limited ability to influence the logistics operations and therefore he is not able to efficiently utilize the potential of multinational support solution.

Current operations have also shown that the majority of NATO forces have limited capabilities to work in a networked environment. Therefore it is necessary to create such a support system that would be able to provide support for operational planning, joint deployment of forces and their sustain ability, which would lead to increase of combat power and efficiency of operations.

4. Requirements for the development of new information environment

Appropriate network information environment and adequate tools are essential prerequisites for improvement of the efficiency of logistics in current operational environment, which is characterized by frequent changes and the need for comprehensive and complex support of multinational forces in a hostile environment, with scarce local resources.

NATO logistics operations can be optimized if the logistics is managed and coordinated within the integrated command and control network.

The solution is to create a new logistics information environment, LOG FS (Logistics Functional Services), which would replace the existing LOGFAS. Since the NATO Commander must have an adequate command and control capability to coordinate national and multinational logistics to be able to execute his operational tasks, the new logistics information environment should be designed to facilitate the work of logistics staffs at all levels. It is essential that the LOG FS provides the functionality needed for
command and control of all components of logistics, including the provision of logistics information into the Common Operational Picture.

From the LOG FS project it is expected to maximally use the existing tools and capabilities (such as LOGFAS) and to provide additional functions that would reflect operational requirements and that are not supported at this time. It is supposed to improve the overall integration, provide interoperable solutions using new technologies and to enhance the whole life cycle efficiency, in particular by removing duplications and centralizing common functions.

This new LOG FS environment will be based on LOGBIDS (Logistics Intelligence and Support Services) as part of an approved Capability Package (CP 9C0103 "Functional Services for Logistics C2"), approved by the North Atlantic Council (NAC) on 29 June 2007. Approval of projects included projects 42 and 43 (consolidation and development phases). Projects 44 and 46 (evolution phase) will be approved as addendum.

NATO summit in Lisbon endorsed the overview of critical capabilities, including development of Logistics Functional Service as part of Bi-SC AIS. The parts of the LOG FS programmed scope were stratified as Capability Level 1 – Essential (Minimum Core Capability Requirement). This means, that without this capability NATO will not be able to effectively support the multinational logistics operations. Other parts, with lower priority, will be developed later. Existing systems that are not in the highest priority will continue to be supported.

During the LOG FS development it is important to follow several essential principles, such as:

1) Collective responsibility - NATO and the individual participating nations jointly organize and provide logistical support to NATO operations, taking into account each other's requirements and constraints.

2) Mutual benefits - Visibility and authority for commanders, savings for nations. The intention is to increase the level of efficiency of logistic support for NATO forces while minimizing costs for nations and to reduce duplications and logistics footprint.

3) Visibility and accessibility of information for users - In order to optimize the management of logistic support, exchange of information and a visibility over the logistics requirements, resources, and processes is necessary in all phases of the operation.

4) Standardization - All existing systems and systems that will be developed (e.g. in accordance with the force goals) should be developed with consideration of their possible inclusion (or an interface) into a common information environment. Their development should be in accordance with existing international standards (ISO, STANAGs).

For the LOG FS development it is important that the NATO Commander, nations as well as other participants have the opportunity to view the declared capabilities. The NATO Commander should be able to set priorities and evaluate deficiencies that could limit national contributions. There should be also developed a capability to identify potential solutions to overcome shortfalls and enable the opportunity to offer mutual support. The new environment should be able to cover the full spectrum of logistics.

5 Proposal for a new information support

To meet requirements and to achieve the full operational capability of LOG FS, four projects need to be realized. Projects 42 and 43 are part of the approved Capability
Package 9C0103 and their implementation is expected to be completed in 2016. Projects 44 and 46 will be addressed through an addendum to CP 9C0103 and should be completed by the end of 2018. Timelines of the development of individual projects, however, are affected by many factors, such as the availability of funds, the length of the approval process in the various committees, and in the future also by assessment of the proposed solutions. So these timelines are only estimates.

As already mentioned above, the LOG FS objectives will be achieved through the implementation of the program, which consists of three phases:

1) Consolidation phase (integration of existing systems - Project 42).
2) Development phase (implementation of new functionalities, resulting from research and development and experimental programs - Project 43).
3) Evolution phase (additional functionalities, improved performance, integration and use of new technologies - projects 44 and 46).

Desired scope and functionality of LOG FS exceeds the ability of NATO to create such an environment alone. Therefore NATO released the invitation for bids for projects 42 and 43. One of the most important prerequisites is that existing functionality, provided by existing systems must be maintained. However, existing systems can be replaced by equivalent systems or modification of COTS systems that meet functional requirements. During the implementation of the new information environment it is desired to avoid the "big bang" delivery, which assumes that the implementation will be conducted in the form of multiple iterations. This means that the particular projects will be gradually developed, tested and consequently implemented.

The development of the system must take into account also the fact that system users will operate not only in static locations, but will be deployed to operations, principally the NRF. These users can be deployed anywhere according to the situation requirements, to the locations without available information infrastructure.

Another significant challenge is a change of developers. This could be a very expensive process in terms of financial costs, time and human resources, which may affect the availability of resources for the future functional systems enhancements. The cost of LOG FS will depend on the solutions proposed by the contractor. Nations would normally pay license fees for all standard COTS components. NCIA is taking measures to ensure that LOG FS capabilities will be provided to nations under the same conditions as when they are used for defensive purposes at the request of NATO. Nevertheless, there is no guarantee that the final solution will be provided to nations without additional financial costs. Developers, who will minimize the license fees of developed system, will have therefore a higher chance of winning the competition.

There are several options how to reduce the costs. For example by creation of several data centers with servers and data storage, to which nations could access as a remote users through the NATO infrastructure, instead of installing local servers. This would reduce the cost of support, local administration and maintenance and therefore significantly reduce the cost for nations for using LOG FS. Since nations have different approach to the proposed solutions (centralized NATO servers vs. national), it is likely that both options will be offered to nations for consideration as part of the contract to be signed with the winning bidder.

One of the fundamental problems is most likely related to the possible licensing of the final product. This might have a significant negative impact on broad use of systems and would discourage nations from willingness to cooperate.
Moreover, due to the fact that NATO does not conduct operations alone, but is supported by the partner nations (NATO provides its systems to these nations), it would be necessary to find possible solutions how to continue and support them, either through the common funding, or by willingness of volunteer nation to bear the cost of others. In addition, the project has an ambition to include also civilian actors (e.g. contractors), therefore the Alliance should find a suitable solution.

6 Conclusions
Development of a new information environment is not an easy task. Besides financial implications it brings a number of additional risks and challenges, which may affect the functioning of the information environment. However, if the implementation of those particular individual projects succeeds, the LOG FS would become a tool that will significantly increase the efficiency of provided logistical support. The expected benefits from the use of the new information environment include:
- reduction of stocks;
- reduction of the number of logistics units and elements;
- reduction of the number of logistics resources and assets, especially in the area of transportation and storage;
- reduction of the volume of transported material;
- reduction of the need for storage capacity in seaports and airports;
- reduction of number of contracted companies;
- effective use of scarce local resources, including reducing the subsequent increase of the prices;
- increase the possibility of the use of modern logistics assets and tools;
- simplification of the decision-making processes in the area of command and control due to the implementation of common procedures.
Usage the LOG FS will result in a reduction of the total cost of the logistic support and will also increase the efficiency of the execution of logistic support.

Acronyms

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<th>Acronym</th>
<th>Description</th>
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<tr>
<td>AIS</td>
<td>Automated Information System</td>
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<td>C2</td>
<td>Command and Control</td>
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<td>COTS</td>
<td>Commercial-off-the-Shelf</td>
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<td>CP</td>
<td>Capability Package</td>
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<td>ISO</td>
<td>International Standardization Organization</td>
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<td>LOG FS</td>
<td>Logistics Functional Services</td>
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<td>LOGBASE</td>
<td>Logistics Database</td>
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<td>LOGBIDS</td>
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<td>LOGFAS</td>
<td>Logistics Functional Area Services</td>
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<td>NCIA</td>
<td>NATO Communications and Information Agency</td>
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<td>NRF</td>
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