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THESES

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**Analysis of NATO Operational Logistics Support
using a Multi Criteria Decision Making Method**

Ph.D dissertation

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Actuality of the Research

With the Crimean Crisis (2014), the security environment in Europe has fundamentally changed again, realizing in Europe the need to shift the focus of military operations from expeditionary, extraterritorial to territorial defense. Although this shift in emphasis represents in part a direct rebalancing of the overriding importance of post-Cold War crisis management operations in the spirit of political independence and security and collective defense of territorial integrity under Article 5 of the NATO Charter, it cannot be said that this rebalancing is the same. Before 1991. On the other hand, it can be clearly stated that with this shift in emphasis, an era is pushed into the background for the time being, although due to its nature it cannot be permanently lost. The strategic geopolitical and military-strategic situation after Crimea is no longer only in the Cold War, but, especially from a logistical point of view, as the operational border, due to the NATO enlargements of previous decades, no longer also has off-site crisis response features. This means that operational and logistical experience gained during

crisis response operations can not only be put to good use but must also be integrated into the concept of territorial protection and deterrence. However, referring back to the shift in operational focus and the partial delegation of an era, it is clear that the path that military operations have taken since the Cold War, especially in terms of logistics, needs to be assessed and summarized in terms of experience and results for the future.

Therefore, it can already be seen that the further research direction of the dissertation, as it focuses primarily on a semi-closed period, can be stated that with the re-emergence of collective defense, operational logistical support of the new geopolitical situation, crisis response operations, and pre-1991 Cold War. what new, possibly hybrid features it will have.

Scientific Problem

During the decades that have passed since World War II to the present day, military operations have changed several times in nature and volume. It can be stated that in the process, the end of the Cold War and the Crimean crisis can be considered epochal watersheds, while the periods in between can be

considered independent. All this means that with the dissolution of the Soviet Union, the bipolar world system became unipolar, and the fundamentals of the interpretation of security changed, just as it did after the separation of the Crimean peninsula from Ukraine. The two-part era between the two watersheds will be referred to as the era of crisis response operations. The era of crisis response operations is also characterized by the fact that a change of era occurred in the interpretation of security compared to the previous ones. The change in the interpretation of security also brought about a transformation in the nature of operations, and the change in the nature of operations stimulated new processes in operational logistics support.

There was therefore an era (1991-2014) in which the perception of security and the nature of military operations changed compared to the previous one, and I am investigating how the changes can be demonstrated and substantiated with, among other things, new methods.

Research Goals

Among the research objectives, the examination of the changes that operational logistics went through in the more than two decades after the Cold War, and the development directions that characterized the changes, occupied a primary place. In this direction, I focused the investigation primarily on the conditions, methods and strategy influencing operational supply on the battlefield. As a result of the investigation, I expected definite trends to emerge in the comparison of Cold War and crisis response operational logistics.

As an additional research goal, I formulated the demonstration of the operational shaping effect of operational logistics support and the substantiation that there is a certain degree of dissonance between operational logistics experiences and basic doctrinal guidelines. I expected from the research that the relationship between operations and logistics support is functional, i.e. mutually clear, and that the determining guiding principles of theory and practice differ in priority compared to each other.

Finally, among the research objectives of the dissertation, I have reserved a special place for the new and modern connection of military science and decision theory. From the connection of the two scientific fields, I expected that the research hypotheses and results could be verified in an exact way.

Research Hypotheses

Based on the research objectives, I formulate the following hypotheses.

1. I assume that there have been fundamental changes in the logistical support and basic guidelines of the crisis response operations compared to the operations of the Cold War era.
2. I assume that not only the operations shaped the logistics support, but the logistics support also shaped the operations.
3. I assume that the operational logistics experience shows a dissonance compared to the support federal doctrinal basis and guidelines.
4. I assume that the change in operational logistics support can also be proven using a decision theory method.

Research Methods

Since the post-Cold War era of crisis response operations can be considered busy and significant on a historical scale, the verification of the hypotheses was based on an exploratory method, document analysis (analysis), and conclusions were drawn using different theories (synthesis). During the document analysis, where it was appropriate, I also enhanced the content analysis of the text with elementary statistical methods (mathematical method). In this regard and the research phase, I supplemented the document analysis with the study of domestic and international literature (secondary analysis), in which I relied on my practical experience and the knowledge acquired during my many years of the educational activity (empirical method).

I carried out the research in an action-specific manner, during which I identified experiences and made partial summaries, then summarized the results and conclusions drawn (deduction) by exploring similarities (analogy) and differences (comparison) and formulated them in a general way (synthesis).

In the second stage of the research, I carried out a bibliometric survey (mathematical method, statistical data analysis), and based on the results of the first stage, I set up a multi-level, complex decision theory model. Based on the decision theory model, I compiled questionnaires based on pairwise comparisons (mathematical method). Since no preliminary or usable results from other sources were available and I placed the emphasis on the verification of the hypotheses on group decision-making instead of individual, I chose a classic questionnaire (self-filled form) approach based on the program used for the research (superdecision v2.10).

I asked specialists with experience in military operations and/or operational logistics to fill out the questionnaires (basic research, primary data collection method). When selecting the respondents, I also tried to ensure that among the specialists there were not only people with logistics, but also people with command, operational or other leadership experience in accordance with the proportions of the system of criteria. When the experts were asked, several decades

of military experience came up as an additional important aspect, since it is a time span that extends significantly in time, but can still be covered by a military career. I tried to ask the respondents not only from the vertical management spectrum of military logistics, but also from the horizontal professional fields in order to carry out the most comprehensive investigation. When determining the number of respondents, I took into account the numbers available in the literature for group decision-making. In order to compensate for invitation rejections or absences due to other reasons, in order to maintain time management aspects, I created a safety reserve. Given the scope of the questionnaires, I limited the time required to fill out the questionnaires to three months first, and then to six months after preliminary discussions. The changes in the time limit were primarily due to the busyness of the respondents at work and their summer vacation, which otherwise would have resulted in a significant decrease in the number of respondents. Overall, there were no invitation rejections, and only 10-15% of respondents were dropped out.

I asked specialists with experience in military operations and/or operational logistics to fill out the questionnaires (basic research, primary data collection method). When selecting the respondents, I also tried to ensure that among the specialists there were not only people with logistics but also people with command, operational or other leadership experience following the proportions of the system of criteria. When the experts were asked, several decades of military experience came up as an additional important aspect, since it is a period that extends significantly in time, but can still be covered by a military career. I tried to ask the respondents not only from the vertical management spectrum of military logistics but also from the horizontal professional fields to carry out the most comprehensive investigation. When determining the number of respondents, I took into account the numbers available in the literature for group decision-making. To compensate for invitation rejections or absences due to other reasons, and to maintain time management aspects, I created a safety reserve. Given the scope of the questionnaires, I limited the time required to fill out

the questionnaires to three months first, and then to six months after preliminary discussions. The changes in the time limit were primarily due to the busyness of the respondents at work and their summer vacation, which otherwise would have resulted in a significant decrease in the number of respondents. Overall, there were no invitation rejections, and only 10-15% of respondents dropped out.

Ten specialists provided 1,476,000 data on the two-part (Cold War, Crisis Response Operations, pages 157-157) and two-level questionnaires (strategic level (46 pages), operational level (111 pages)) consisting of a total of 314 pages. I aggregated the experts' answers using the geometric mean. I did not investigate possible characteristic differences of opinion between respondents, as I was researching a general trend and there was no scope and time to reveal individual reasons. I believe that relevant characteristic differences of opinion can only be demonstrated with other people and in the case of setting up several control groups with the same or similar composition, with repeated surveys. The same conclusion can be

made, for example, to explore aspects such as the correlation between a unique opinion and the nature of the work performed. However, it is important to note the above examination aspects that it is relatively rare if the individual life path only and exclusively affects a certain area since the management and professional advancement system does not generally support this.

In addition to the size of the data set, it should be emphasized that, where necessary, the consistency indicator of the results of the questionnaires could be enhanced with multi-step iteration through the Delphi method, and I could fulfill the conditions for the statistical acceptability of the consistency level (mathematical method). I consider it an important scientific result that, by applying the decision theory method, I brought to the surface and synthesized tacit knowledge that precisely supports and reveals the connections behind experiences and statistics.

I evaluated the results of the questionnaire survey, drew conclusions, formulated suggestions, and showed directions for their utilization (applied research).

Structure of the dissertation

Dissertation 1-2. chapters review and compare NATO's defining Cold War and crisis response processes and strategic documents in chronological order. Chapter 3 deals with logistics support for civil operations contractors. As a result of operational experience and document processing, the dissertation explores the fundamental changes in operational logistics and identifies the driving forces and characteristics of the changes. The identification of the characteristics serves as the basis for justifying the changes using the decision theory method. (Chapter 4)

Summary conclusions

Hypothesis 1: I assume that there have been fundamental changes in the logistical support and basic guidelines of the crisis response operations compared to the operations of the Cold War era.

Conclusions:

1. The basic operational logistics experiences are independent of the battlefield, that is, the most important characteristics can be directly explored

and examined and a specific model can be established concerning them.

2. Upon the appearance of a changed security policy environment and new types of operations, it is necessary to immediately and systemically examine what demands appear with the forces and their logistical support, and at the same time to explore the shift in emphasis that has occurred in the basic and directives of logistical support. The revealed shift in emphasis must also be validated in skill development.
3. The shift in emphasis on the basic guidelines of logistics support can be effectively examined using the ANP decision preparation method. It is also recommended in terms of the introduction of the method in training and practice, experience processing, and cost-effectiveness.

Hypothesis 2: I assume that not only the operations shaped the logistics support, but the logistics support also shaped the operations.

Conclusions:

1. By changing the characteristics of logistical support, the nature and capabilities of forces and operations can also be forecasted.
2. Due to the network-like complexity of the investigation, only and exclusively the application of the Analytic Network Process procedure can be accepted.

Hypothesis 3: I hypothesize that operational logistics experiences show dissonance with the support federal doctrinal basis and guidelines.

Conclusions:

1. NATO's operational experience is only generally reflected in the doctrinal principles and guidelines.
2. The dissonance between logistics support basic and directives and operational experience can be solved by a weighted review and/or by creating primary and secondary basic and directive groups according to operational nature.
3. The doctrinal change of the principles must be carried out by involving a representative base of theoretical and practical experts and applying

decision-making methods in order to explore and confront characteristic differences of opinion.

Hypothesis 4: I assume that the change in operational logistics support can also be proven using the decision theory method.

Conclusions:

1. The application of decision theory methods in military science is not only a tool, but also a compass for its new and modern approach.
2. The application of decision theory methods in military science does not replace, but only complements and strengthens.
3. The application of decision theory methods in military science is only established for the time being, further results are needed for their establishment and the development of sector specifications.

New Scientific Results

1. I created the general decision theory model of operational logistics support.
2. I proved that the historical changes in operational logistics support based on document analysis and

operational experiences can be proven by applying decision theory methods. As a result of the proof, I also showed the shift in emphasis on the political, economic, and military aspects.

3. By comparing the results of operational experience processing and document analysis, I pointed out that the change in practice is not directly reflected in the NATO logistics doctrinal principles. I substantiated the phenomenon with a decision theory method and formulated suggestions on how to change it.
4. I carried out the analysis of the nature of logistics support and the operation of the military supply chain in a unique approach, by connecting resource dependence, organizational theory, and the theory of justified action in a simplified model of logistics support and proved the change of military operational logistics support.

Practical applicability of research results

The results of the thesis can be used:

1. in the areas of operational experience processing, evaluation, and control.

2. to determine the requirements of logistics support for national operational units outside the country's borders and to establish an order.
3. in the definition and evaluation of professional aspects related to the development of operational logistics and the procurement of military equipment.
4. in the development, evaluation, and selection of action variants of logistics operation planning.
5. in revising and developing regulations and documents.
6. in basic and master's courses of military higher education as well as senior management and doctoral training.

Recommendations

I recommend reading this dissertation primarily to specialists in the field of operational logistics, as the work is about this field, it helps to understand its controlling processes, recognizes their own experiences, stimulates thought, and gives courage for a new and modern approach to problems and tasks.

Second, I recommend the dissertation to those in senior positions, since they are the ones who can directly shape the attitude and military culture by applying new and modern methods.

In connection with the thesis, I am thinking thirdly of those working in strategic operational planning and decision-makers, since the basis of all correct guidance and evaluation is well-founded objectivity and knowledge of the creative human and operational environment.

Finally, I recommend the work to all professionals who want to remain open about their field, since one of the essential points of the dissertation is that changes often remain invisible below the surface.

List of publications

1. Nyitrai Mihály:

Analysis and Conclusions of Lessons Learned of Hungarian Defence Forces in Logistics-technical Support during UN, NATO, EU and OSCE Peacekeeping Operations

- In: A hadtudomány és a XXI. század (tanulmánykötet): Doktoranduszok Országos Szövetsége (Hadtudományi Osztály); (ISSN: 2498-5228): pp. 211-223; (2018)
2. Nyitrai Mihály:
Tapasztalatok az EUTM Mali világából
In: Hadtudományi Szemle (ISSN: 2060-0437): 8 (4)
pp 84-99 (2015)
3. Nyitrai Mihály:
Eredmények a szövetséges stratégiai légi és tengeri szállítóképesség erősítése terén
In: Hadtudományi Szemle (ISSN: 2060-0437): 9 (2)
pp 73-94 (2016)
4. Nyitrai Mihály:
Az AFISMA és a MINUSMA logisztikai kapcsolata
In: Honvédségi Szemle: Magyar Honvédség központi folyóirata (ISSN: 2060-1506): 144 (4) pp 102-118 (2016)
5. Nyitrai Mihály:
Műveleti logisztika Afganisztánban
In: Katonai Logisztika (ISSN: 1588-4228): 2016 különszám pp 392-409 (2016)

6. Nyitrai Mihály:

Quo Vadis Sustainable Military Operations?

In: Academic and Applied Research in Military and Public Management Science (ISSN: 2786-0744): 16 (2) pp 83-95 (2017)

7. Nyitrai Mihály:

Expedíciós műveletek egészségügyi biztosítása: a Role 2 ellátási tagozat helye és szerepe

In: Hadtudományi Szemle (ISSN: 2060-0437): 10 (3) pp 196-218 (2017)

8. Nyitrai Mihály (könyvfejezet):

Az első balkáni NATO- és EU-műveletek logisztikai támogatásában szerzett tapasztalatok

In: Horváth L Attila (szerk.) 52 év a katonai logisztika szolgálatában Budapest: Dialóg Campus Kiadó, pp 101-118 (2017) ISBN: 978-6-155-68053-3

9. Hornyacsek Júlia, Nyitrai Mihály:

Területi járványügyi veszélyhelyzet egészségügyi és logisztikai támogatása

Hadmérnök (ISSN: 1788-1919): 13 (1) pp 73-96 (2018)

10. Porkoláb Imre, Nyitrai Mihály:
Top Gun: A szervezeti tanulási folyamatok megújítása és a tapasztaltfeldolgozó rendszer újragondolása
In: Honvédségi Szemle: Magyar Honvédség központi folyóirata (ISSN: 2060-1506): 147 (6) pp. 3-21. , 19 p. (2019)
11. Lakatos Péter, Nyitrai Mihály:
A karbon lábnyom logisztikai aspektusai
Hadtudományi Szemle (ISSN: 2060-0437): 11 (1) pp 342-358 (2018)
12. Kende György, Nyitrai Mihály:
Sakk és hadtudomány
In: HADTUDOMÁNYI SZEMLE (ISSN: 2060-0437): 8 (3) pp 160-169 (2015)
13. Nyitrai Mihály:
A nem halálos fegyverek és az információs műveletek
In: Honvédségi Szemle: Magyar Honvédség központi folyóirata (ISSN: 2060-1506): 145 4 pp 28-38 (2017)

14. Krajnc, Zoltán (szerk.); Forgács, Balázs (szerk.); Gőcze, István (szerk.); Szabó, József (szerk.); Szabó, Miklós (szerk.); Besenyő, János (szerk.); Csikány, Tamás (szerk.); Harai, Dénes (szerk.); Holndonner, Hermann (szerk.); Horváth, Attila (szerk.) et al.
Hadtudományi lexikon: Új kötet Budapest, Magyarország: Ludovika Egyetemi Kiadó (2019) , 1 199 p.

Curriculum Vitae

1. Personal details

Name: Mihály Nyitrai

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2. Education

2015-2018 National University of Public Service,
Faculty of Military Science and
Officer Training, Doctoral School of
Military Science

1994-1997 Technical University of Budapest
(mechanical engineer)

1990-1991 Bolyai János Military Technical Academy (military engineer in Armaments)

1987-1990 Voronov Military Artillery Academy (Penza)

3. Professional Experience

2014– National University of Public Service, Faculty of Military Science and Officer Training (Assistant Lecturer)

2005-2014 HDF Logistics Supply Center (Base Commander)

2001-2005 HDF Logistics Directorate J4 (Senior Planning Officer)

1997-2001 HDF Ammunition Supply & Maintenance Center (Head of Technical Department)

1991-1994 HDF Ammunition Supply Center (technical and logistics officer)

4. Missions

2014 EUTM Mali (operational liaison officer)

2013 EUTM Mali (operational liaison officer)

2011-2012 EUSEC RDC (military adviser)

2009 NATO ISAF RCN (senior logistics
officer)

5. Languages

English C1

French B1

Russian B1

6. Academic activities

research field: operational logistic support,
military application of decision theory