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**RESEARCH PROJECT:**

**THE INTEGRATION PROBLEMS OF THE MILITARY  
LOGISTICS SYSTEMS OF POLAND AND NATO**

**FINAL REPORT**



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## INTRODUCTION

The research project “The Integration Problems of the Military Logistics Systems of Poland and NATO” has been conducted in the **Logistics Institute** of the Military University of Technology in Warsaw since September 1996 thanks to the NATO Research Fellowship received in May 1996, and according to the Fellowship Agreement signed in July 1996 between the NATO Office of Information and Press (NATIP) and the Commandant of the Logistics Institute.

The goal of the project was to identify to what degree the Polish military logistics system is prepared for the integration with NATO. The project included the evaluation of the fundamental spheres of military logistics: logistics policy, planning, supply, maintenance, movement and transportation, medical support and infrastructure.

Additionally as a result of seminars and meetings with NATO logisticians and scientists working in the sphere of military logistics as well as a consequence of certain conclusions from the lessons learned during participation of Polish logisticians in peacekeeping operations in Bosnia – the Polish “Production Logistics” (or “Acquisition Logistics”) have been also examined from the integration issues’ point of view.

After initial studies on integration problems referring to basic functions of military logistics, to fundamental notions, definitions and their meanings in the NATO’s and Polish logisticians languages – finished in November 1996 – the actually existing differences between the military logistics of selected NATO countries (United States, Great Britain, Germany, France) and Poland as well as the differences between the NATO’s logistics principles, policies, organizations and procedures have been specified and discussed from December 1996 to May 1997.

As a result of those comparative analyses the fundamental hypothesis of the project has been formulated as follows.

**Polish military logistics, in general, is able to meet the NATO logistics requirements although the degree of the preparations is different on different organizational levels and in different spheres (functions) of the logistics. The main differences consist in:**

- **quantitatively sufficient “logistic hardware” (equipment, materiel assets, installations) with necessary required selected qualitative changes, and - generally insufficient “logistic software” (principles, policies, planning, organization, procedures, standards, knowledge on NATO logistics);**
- **relatively better (from the integration point of view) situation on tactical levels than on operational and central levels (transparency of mutual relations, subordination, sharing responsibilities, principles of co-ordination);**

- **mobile (organic) logistic potential corresponds to NATO requirements better than the stationary one (particularly on the level of military district and logistic area);**
- **the degree of preparation of medical support system, mobile supply and maintenance systems – higher than the one of infrastructure, movement and transportation as well as stationary (territorial) supply and maintenance systems.**

During the next stages of the research project the hypothesis has been tested against the identified NATO detailed requirements referring to particular spheres of military logistics (June – September 1997) and Polish logistics systems capabilities (September – December 1997). Subsequently the necessary activities to fulfil the compatibility and interoperability needs as well as to accelerate the integration processes in particular spheres have been specified and prioritized (January – March 1998).

Final conclusions have been gathered from particular spheres of military logistics – then generalized and included in the Final Report (April – June 1998).

The study on the Polish “Production Logistics” has been conducted simultaneously since September 1997. The hypothesis that **the materiel and legal status of Polish defence industries are not sufficient to meet NATO challenges and requirements in armaments cooperation; also that arms procurement decision – making procedures and planning have not been adjusted and synchronized so far with corresponding NATO planning processes and procedures for armaments cooperation** has been tested against the civil and military experts’ opinions and analytic works on mutual relations, sharing responsibilities and subordination of the institutions participating in arms procurement procedures.

The project was conducted basically in the Logistics Institute of the Military University of Technology in Warsaw but also in the selected logistic units and bases of Polish Armed Forces. In particular cases the selected civil and military logistics experts from the logistics branches of General Staff, Services’ Commands, Procurement Department of the Ministry of National Defence as well as from the National Defence Academy were asked to express their opinions on certain problems. The broad consultations with NATO and NATO countries (USA, France, Germany) logistics experts took place during seminars, symposiums and meetings.

We would like to thank Mr William G.T. Tuttle, Jr (US Army ret. Gen.) – President of Logistics Management Institute (LMI) and particularly the author of the idea of the US – Polish logisticians meeting - Mr David Garner (ret. Col. USMC) and Mr Frank A. Tapparo from the Institute as well as their colleagues from LMI for their initiative, advices and opinions presented during the first seminar “US – Poland Bilateral Logistic Information Exchange” from 11 to 15 May 1998. We also would like to thank Col. Charles J. McKenzie from U.S. Army Materiel Systems Analysis Activity for information given us during our consultations in the United States in February 1997.

We also owe special thanks to Col. Jean – Sebastien Tavernier and Lt. Col. Jean – Pierre Fontaine from French Military Mission in Warsaw for their advices and lectures on the principles and organization of logistics in French Armed Forces.

The project allowed to increase significantly the knowledge of the scientific and educational personnel (civil and military) employed in the Logistics Institute of the Military University of Technology – on the principles, policies, organization, procedures and standards of NATO logistics as well as to improve the education programs for the students of the Military University of Technology, postgraduate students and candidates for a doctors degree. For the co-operating with the Institute representatives of civil and military institutions (Logistics Branches of General Staff, Services Commands, Procurement Department of the Ministry of National Defence it helped to realize the scale of shortcomings and distances between selected NATO requirements and the capabilities of Polish system.

The additional advantage of the project was the promotion of the idea of integration with NATO in the circles of civil and military logisticians.

## 1. LITERATURE REVIEW

On the first stage of the project the literature was treated as the basic source of information on NATO logistics principles, policies, structures, procedures and standards. One of the most useful positions on that stage appeared “ **NATO Logistics Handbook**” published by Senior NATO Logisticians’ Conference Secretariat. During conducting the research project the second edition of the “handbook” (from April 1994) was translated into Polish in the Logistics Institute and then published by the Military Standardization Service Bureau and popularized in the circles of Polish civil and military logisticians. In October 1997 the third edition appeared taking into account NATO’s enlargement problems and PfP. The “NATO Logistics Handbook” presents the broad spectrum of knowledge not only on the logistics but on the Alliance structures and functioning as well. The “Handbook” gives general information on NATO’s approach to logistics (Consumer Logistics and Production Logistics, Cooperative Logistics, Multinational Logistics, CEP and HNS logistic problems) and then describes in details particular logistic functions (supply, movement and transportation, medical support et.c.). There are also special chapters devoted to logistic support for peace operations, standardization and interoperability problems, NATO military common funded resources. Other important position useful not only on the first stage but during the whole period of the project was AAP – 6 – “NATO Glossary of Terms and Definitions” – also translated into Polish in the Military University of Technology.

The next important documents studied in the course of the project were: MC 319/1 NATO Principles and Policies for Logistics, MC 55/3 Readiness and Sustainability Factors, Land Forces Logistic Doctrine ALP - 9(B) - STANAG 2406 from May 1995, MC 327/1 NATO Military Planning for Peace Support Operations.

Those documents presented more details on the concept of logistic support of the Alliance’s new strategy.

Simultaneously corresponding Polish literature have been studied. The basic document was “**Armed Forces Model 2012**” worked out by the General Staff and accepted by the Minister of National Defence. The document established goals and main directions of further transformations of Polish Armed Forces. Basing on this document the “**Military Logistics Concept - Model 2012**” has been worked out by the Logistics Branch of the General Staff. There are three main points of the concept presented in the last document. The first one concerns the division of military logistics into:

- mobile (organic) logistics of the tactical level units (battalions, brigades, divisions),
- stationary (territorial) logistics able to furnish logistic support during peace and war time basing on regional logistics commands structures (logistic areas) and logistic materiel and maintenance bases.

The second point assumes that the mobile (organic) logistics on tactical levels will be based on versatile (modular) logistic subunits and units: logistic

companies, battalions and regiments: maintenance, supply and medical platoons, companies, battalions.

The third point assumes creating territorial logistics system based on the division of the territory of the country into 7 logistics areas (within the first option) with logistic commands of the areas subordinated to the newly created “Materiel – Technical Command” under the Deputy Chief of General Staff for Logistics (4 logistics areas in Northern - Pomeranian Military District and 3 logistics areas in Southern – Silesian Military District) or within the second option into 4 logistics areas (2 in Silesian and 2 in Pomeranian Military Districts). Logistics Area Commands would have subordinated stationary logistics bases and units (e.g. maintenance depots) as well as mobile assets able to supply combat units deployed temporarily in the logistics area.

The concept “Logistics 2012” has left unsolved the problems of organization, subordination and responsibilities of logistics organs on the level of Military District and on central level (The questionable idea of Logistics Support Command or Materiel – Technical command within the General Staff structure). It is the consequence of not transparent rôle, subordination and responsibilities of Military Districts within the “Armed Forces Model 2012” - which are also the sources of difficulties and obstacles on the way to logistic integration described in the next parts of the report.

Significant group of publications reviewed during the research process were NATO specialistic documents dealing with particular spheres (functions) of military logistics. They were:

- publications concerning Logistics Planning: the mentioned above MC 55/3, Stockpile Planning Guidances and a group of STANAG’s on logistics planning, description of ACROSS system et.c.,
- group of documents on Supply issues: STANAG 1135 (procedures for handling fuels and lubricants), AC/112 – D/241 (The Single Fuel Concept), STANAG’s: 3149, 3747, STANAG’s: 2827, 2828, 2829, 2830, 2926, descriptions of NATO Logistics Stock Exchange, SHARE, COMMIT, PROFIT and NATO Ammunition Data Base,
- publications on NATO Maintenance problems: Battle Damage Assessment, Battle Damage Repair, Cross – Servicing (STANAG 3430), LCC, CAL et.c.,
- publications on Movement and Transportation: MC 336/1 The Movement and Transportation Concept for NATO, STANAG’s: 2156, 2165, descriptions of ADAMS system, AMCC, TMCC missions,
- group of documents on Medical Support: MC 326 Medical Support Precepts and Guidance For NATO, Directives AD85-5, AD85-8, STANAGs: 2126, 3242, 2939, 2061,
- publications on Production Logistics: AAP – 20 Handbook on the Phased Armaments Planning System (PAPS), AAP – 27 (CAPS), ALP – 10 Guidance on Integrated Logistics Support for Multinational Equipment Projects, descriptions of CNAD organization and mission as well as of NATO Project Steering Committees.

Important part of studied literature were publications concerning CEP, HN and Logistic Support for Peace Support Operations:

- C – M(85)69 The Role of SCEPC in Peacetime, Crisis and War,
- C – M(92)14 Consequences for Civil Emergency Planning of the New Alliance Strategic Concept,
- C – M(95)31 NATO Policy on Cooperation for Disaster Assistance in Peacetime,
- MC 334/1 NATO Principles and Policies for HNS Planning,
- MC411 NATO Civil – Military Cooperation Policy,
- ALP – 12 Guidance for the Planning and Preparation of Host Nation Support Agreements/Arrangements,
- MC 327/1 NATO Military Planning for Peace Support Operations.

The basic literature for evaluating and estimating the degree of preparation of Polish military logistics system for integration with NATO in particular spheres (functions) of logistics was the group of documents dealing with PARP (Planning and Review Process) and Target Force Proposals for Poland. This group was divided into three subgroups - the so called PARP – I (General Interoperability Review - 1997), PARP - II (Polish Interoperability Objectives 1997 – 1999) and the documents presenting the military logistics response for Target Force Proposals.

The most important document included in the second subgroup was “Decision No 145 of The Minister of National Defence from August 14, 1977” [27] establishing the schedule of securing 41 interoperability objectives. The decision assigned selected units and organizations to particular objectives and determined the time and principles of supervision, control and support for the process of achieving the objectives.

The military logistics “reaction” to the Minister’s decision was “Deputy Chief of Staff for Logistics Guidance on achieving the logistic goals of interoperability in the Armed Forces and in units selected to the cooperation with NATO”. The Guidance established the organizational principles and responsibilities (supervision, control) for carrying out the process of securing logistics interoperability objectives.

In May 1997 the initial draft appeared of AJP – 4 Allied Joint Logistic Doctrine in which the ideas of logistic responsibilities and authorities have been explained as well as the new concepts of multinational logistics and HNS.

In December 1997 Poland (participating since 1996 in selected phases of NATO defence planning process) received document “Allied Command Europe Target Force Proposals - Poland” (draft as of 20 December 1997) with a list of 65 targets - prioritized and scheduled in time. During April and May 1998 Logistics Branches of General Staff and Services worked out plans and schedules for securing the logistic targets as well as costs estimates for particular targets.

These documents appeared particularly important in the last stage of the project together with publications prepared for the seminar “US - Poland Bilateral Logistic Information Exchange” by both US and Polish side. During the Seminar in May 1988 the new Multinational Logistics Doctrine was presented by the U.S. side and discussed with Polish logisticians. The possibility of studying and discussing the new ideas and concepts concerning Multinational Logistics (included in MC

319) has appeared relatively late (May 1998) but they have been taken into account in the last stage of the project.

The last part of reviewed literature were different additional publications like: "Allied logistic information pamphlet" (worked out by Bad Kreuznach Battle Simulation Center) describing organization of logistic support on tactical levels in different NATO - members countries, "Compendium of Lessons Learned During Logistics Support of Peacekeeping Operations", the documents of SNLC Logistics Staff Meeting and Ad Hoc Working Group on Conceptual Logistic Documents dealing with updating MC 334/1 (HNS) and with so called "Third Party Logistic Support Services", the documents on NATO Standardization Program for Function - 09: Logistics, the Movement and Transportation Advisory Group document on the use of ADAMS system, the Decision Sheet of the twenty - fourth Meeting of the LSM held with Partner Nations at NATO Headquarters (Brussels, 28 th January 1998).

There are some conclusions - as consequences of the literature study carried out during the project. Although the number of publications of both sides NATO and Poland has been sufficient enough to compare actual NATO requirements with the results of preparations which Poland has obtained hitherto in the different spheres (functions) of military logistics - there also appeared difficulties of more general nature. There have not been available so far any documents establishing or forecasting the future place or the mission or even the specialization of Polish Main Defence Forces within the strategic concepts of the Alliance. Apart from selecting the first units destined for participation in NATO Reaction Forces, Multinational Corps and Peace Support Operations as well as from preparing single facilities and objects to be used by NATO forces - it also seems important to have at least certain general informations on the operational tasks within contingency plans or at least, operational assumptions to determine future orientation, potential and direction of development of military logistics: infrastructure, movement and transportation assets, supply system, maintenance and medical support organization. The long term logistic planning needs assumptions on the possible variants of using not only the units assigned to the Reaction Forces but Main Defence Forces as well, their operational deployment and subsequently their future requirements for the logistic support.

## 2. LOGISTICS POLICY

### 2.1. Historical remarks

The present day logistics policy in Poland depends - on one hand - on the historical processes the result of which is actual state of defence system, organization of the Armed Forces, their armament, equipment and infrastructure with still visible “heritage” of former system - on the other hand - on the assumptions concerning directions of the future development of the Armed Forces and particularly the premises of “Armed Forces Model 2012” [20] which at present is treated as the basic concept for future doctrinal, organizational and executive solutions [20, 46, 47].

The transition from the military logistics based on the centrally – planned economy to the logistics based on the market economy cannot be faster than the transformation of the economy itself and particularly than the transformation of defense industries from the monopolized weapons production to the competition on the weapons market.

The actually existing differences between the military logistics systems of NATO and Poland - as a result of the historical processes that shaped the doctrine, the forces’ organization, the armament and equipment during last fifty years - are still significant.

Military logistics policy strongly depends on the government policy of transforming the economy of the country.

Despite the efforts made by successive governments in Poland - the privatization process goes not so fast as it was expected at the beginning of the transition.

Although every NATO nation has developed its own logistics principles, organization and practices, and these have evolved as a result of the foreign and domestic policy, military doctrine and experience, and geographical considerations of the country concerned there are also many similarities among them, whilst the economy of Poland as yet is not similar to the economy of any NATO – country and subsequently the military logistics system of Poland is not similar to NATO’s systems. Additionally within NATO special principles apply reflecting the requirements of operating together in a multinational Alliance and they are quite different than the equivalent principles of former Warsaw Pact still having a repercussion on the military logistics in Poland.

### 2.2. Fundamental integration problems

Starting from the fundamental agreed within NATO definition of logistics [51] as:

“The science of planning and carrying out the movement and maintenance of forces. In its most comprehensive sense, the aspects of military operations which deal with:

- (a) design and development, acquisition, storage, transport, distributions, maintenance, evacuation and disposition of materiel;
- (b) transport of personnel;

- (c) acquisition or construction, maintenance, operation and disposition of facilities;
  - (d) acquisition or furnishing of services;
  - (e) medical and health service support.”
- the notions like “Materiel”, “Acquisition”, “Services” - still need thorough interpretation and explanation within the Polish military logisticians language.

For instance the notion of “Materiel” is within NATO understood in significantly larger sense than in Poland. Therefore the meanings of “materiel acquisition policy”, “materiel supply policy” or “materiel distribution policy” are quite different within NATO’s and Polish circles of logisticians. Also the ideas of Host Nation Support (HNS), Civil Emergency Planning (CEP), Production Logistics, Consumer Logistics have never been taken into account in Polish military logistics policy so far. For instance the fourth sub – division of logistics (d) covers the provision of manpower and skills in support of combat troops or logistics activities and includes a wide range of services such as combat resupply, map distribution, labor resources, postal and courier services, canteen, laundry and bathing facilities, burials et.c. [51]. Within NATO these services may be provided either to one’s own national forces or to those of another nation and their effectiveness depend on close co-operation between operational, logistic and civil planning staffs. In Poland the cooperation between military and civil logistics policy makers and planning staffs was never so close. Some mentioned above services e.g. map distribution, postal and courier services, partially labor resources - and the allocation of the remaining services (as well as other logistics functions) in the area of responsibility of different institutions and on different organizational levels of Armed Forces - differ from the existing within NATO - subsequently the logistics policy of the corresponding NATO and Polish institutions is different as well as the cooperation between the military and civil planning organs [21].

The most important integration problem in the realm of logistics policy seems however the standardization of materiel and services, compatibility and interoperability of main equipment, interchangeability of combat supplies, and commonality of procedures. Taking into account the totally different origin of basic weapons and equipment, the orientation and condition of infrastructure as well as the different philosophy of logistics planning processes and procedures in Poland and in NATO – countries - the co-ordination logistics policies concerning the standardization needs qualitatively new approach. Hitherto NATO have solved the standardization problems in order to increase the combined operational effectiveness of the military forces of the Alliance as well as to eliminate unnecessary duplication among Alliance nations in research, development, production, procurement and support of defence systems and equipment. In the case of the former Warsaw Pact country - the applicant for the NATO membership - standardization means - in general - replacement such matters as concepts, doctrine, tactics, techniques, logistics, training, organizations, reports, forms, maps by the new ones. In the domain of materiel it means introducing into service new weapons systems, C<sup>3</sup> I systems, subsystems, assemblies, components, spare parts, fuel and lubricants, ammunition et.c.

The non – less important problem is the long – term policy of location of resources, logistic assets and installations on the territory of the country – according to the national security needs and strategic requirements of the Alliance. It will be also the problem of development of the infrastructure needed to meet crisis management requirements: communications, command and control, information gathering, mobility, flexibility of employment, reinforcement activities and re – supply [21, 59].

Another important aspects which should be taken into account in Polish military logistics policy from the integration point of view are:

- participation in multinational pools of logistic assets,
- rôle specialization in certain logistics areas,
- common funded resources,
- legal solutions facilitating Polish logistics activities during peace operations (principles of contracting, funding, reimbursement).

### **2.3. Basic obstacles in formulating logistics policy**

Although the first document including formulated for the first time logistic principles for Polish Armed Forces has been published already in 1994 [60], the logistic doctrine has not been worked out so far. It is the basic obstacle on the way to adjusting Polish logistics policy to the NATO's one taking into account the assumptions and concepts of MC 319 (NATO Principles and Policies for Logistics and AJP – 4 (Allied Joint Logistic Doctrine) [14, 34]. Because of lack of logistic doctrine the works on Services' (Land Forces, Air Force and Navy) logistic doctrines have been delayed.

The source of all those difficulties is lack of national security strategy or national defence strategy, considered as a part of the Alliance Strategy. The strategy as well as Joint Logistic Doctrine should be the basis for working out logistic doctrines for the defence system of the country, for the Armed Forces and for particular Services.

Another important obstacle in formulating and implementing logistics policy has been so far the not finished territorial – administrative division of the country, the works on which are still conducted in the parliament accompanied by quarrels and emotions. The matters in dispute are the number and the borders of the biggest administrative units – the voivodeship provinces as well as the newly introduced lower level units.

Durng the process of transition one of the fundamental assumptions of Polish military logistics policy was creating the stationary territorial logistics system (based on logistics regions – areas, regional maintenance depots and materiel bases – subordinated to the higher level territorial units – military districts. Long lastng lack of decisions on the number of military districts (finally it has been established that the territory of the country will be divided into two military districts) as well as the not decided so far administrative division of the country – have delayed the building of territorial logistics system.

There have appeared also certain difficulties connected with insufficient precision of legal regulations estblishing the relations between the Production Logistics and Consumer Logistics (“The Public Procurement Act”) [49].

The “Armed Forces Logistics Concept 2012” based on the “Armed Forces Model 2012” [20] is not a finite solution. Many questions are still open. Among 65 Target Force Proposals received by Poland at the end of 1997 [58] there are goals referring directly or indirectly to the military logistics [28, 29]. Some of them, discussed in details in the next paragraphs of the report, need accelerating the works on logistic doctrine and formulating the logistics policy principles more precisely.

### 3. PLANNING

#### 3.1. General remarks

Since 1996 Poland participates in selected phases of NATO defence planning process. After working out national response to the annual Defence Planning Questionnaire and sending it to Allied Command Europe - the Ministry of National Defence received (in December 1997) a draft of 65 Forces Proposals for Poland - presented in the document "Draft Allied Command Europe Target Force Proposals - Poland" [58].

After bilateral negotiations and reviewing the corrected draft by the Military Committee in March 1998 - the Defence Review Committee (during the meeting 15 + 3 in May 1998) modifies it and sends (at the end of May 1998) to the Defence Planning Committee as Target Force Goals draft.

During bilateral negotiations Polish side should foresee and preplan financial resources necessary to fulfil the obligations resulting from the declared commitment and then from the received later Target Force Goals.

One of the fundamental integration problems in this sphere of activity will be acquainting Polish military and civil logistics with methods, procedures and structures by which NATO goals are agreed through the Defence Planning Process and particularly through the Logistics Planning (NATO Stockpile Planning, Determination of Logistics Requirements, Civil Emergency Planning, Host Nation Support Planning) Logistics Responsibilities and Reporting. The actual knowledge on these issues is dramatically insufficient among Polish logistics planning community. The small group of Polish military logistics took part in NATO peace keeping operations working together with their NATO colleagues. Some few of them who participated in logistics planning processes have got certain knowledge concerning mostly the lowest levels (company, battalion, brigade) and specifically oriented (peacekeeping) logistics [25].

Other significant problems concern coordination and synchronization the national economy and particularly national defense planning process with the NATO Defence Planning Process.

The collective nature of NATO's defence demands that, in reaching their decisions, governments take account of the force structure and capabilities recommended by the NATO Military Authorities, and adopted by the Defence Planning Committee, and of the medium and long - term military plans of their partners. The Polish defence planning procedures have changed since 1989 and have been not precisely defined so far as of the basic cycles and decision - making responsibilities. NATO force planning is based on the strict planning cycles: Ministerial Guidance, issued every two years, and Force Goals, covering a six year period, which are adopted every two years and Annual Defence Review, leading to an agreed NATO force plan for the succeeding five years period, the first year of which is a firm commitment of forces to NATO by each nation. The adequate planning cycles and sequences in Polish defence planning process should be then established and synchronized with NATO cycles as well as with the sequence of events for which the development of the Ministerial Guidance is a starting point [31, 32].

The most important, from the logisticians point of view, planning documents are “Readiness and Sustainability Factors” (MC 55/3) [30] and “Stockpile Planning Guidance” [49, 50]. These documents define, clarify and translate into “logistics language” the statements included in Ministerial Guidance and Force Plan. They are practically not known within Polish military and civil logisticians environment. “Readiness and Sustainability Factors” addresses readiness criteria and sustainability parameters to be used in force operational and logistics planning.

“Stockpile Planning Guidance” establishes stockpile requirements for ammunition, fuels and lubricants and other materiel - in order to achieve materiel sustainability. The fundamental, for these documents, notion of “sustainability” is not only incorrectly translated into Polish language but also misunderstood (without taking into account the definition of sustainability in AAP-6).

The mentioned above documents as well as the NATO stockpile calculation methodologies (Level – of – Effort, Lifetime – Oriented and Target – Oriented Methodology), the computer based stockpile planning models, the database of information necessary for operation the computer models used in determining stockpile requirements - should be not only the subject of education but also the topics of discussions, seminars and symposiums organized together by Polish military and civil logisticians and scientists interested in logistic planning and by their NATO colleagues. These activities should be held in the Military University of Technology in Warsaw and in corresponding NATO scientific and educational centers.

### **3. 2. Planning potential**

During the transition process - the military institutions taking part in logistic planning evolved from the following four groups existing before 1993:

- General Quartermaster’s (in those times Viceminister of National Defence) institutions (e.g. Uniform Service, Food Service, POL Service),
- General Inspector’s of Technology (also Viceminister of National Defence) institutions (e.g. Ordnance Service, Tank – Automotive Service),
- Technical and quartermaster’s branches of arms and services’ commands,
- the former Materiel Planning Directorate of the general Staff,

through the solution with two groups existing since 1993 (centralized option):

- institutions of so called Logistics Inspectorate of the General Staff (e.g. Supply Directorate, Maintenance Directorate),
- institutions subordinated to the civil Viceminister of National Defence for Armaments and Military Infrastructure,

to the present organization with the Logistics Branch of the General Staff subordinated to the Deputy Chief of General Staff for Logistics and consisting of four General Staff Directorates:

- Logistics Planning Directorate,
- Materiel Directorate,
- Technical Directorate,
- Military Medical Service Directorate,

the group of Ministry of National Defence Departments subordinated to the Secretary of State - the First Deputy of the Minister of National Defence:

- Procurement and Delivery Department of Weapons and Military Equipment,
- Development and Implementation Department,
- Infrastructure Department,

and the group of Services Command's institutions subordinated to the Services' Deputy Commanders for Logistics:

- Land Forces Command Logistics Branch,
- Air and Air Defence Forces Command Logistics Branch,
- Navy Command Logistics Branch.

As a result of five years lasting restructirization (changes of organizational and functional structures, responsibilities and subordination) the mutual relations and sharing responsibilities during the process of logistic planning are still much complicated and not transparent. Particularly the type and scale of the subordination and sharing responsibilities between the mentioned above Directorates of the General Staff and the Logistics Branches of Services' Commands have not been precisely defined so far as well as the adequate relations between the Ministry of National Defence Departments and General Staff Directorates. Subsequently the procedures of logistic planning have not been upgraded so far, they do not reflect the recent structural changes, subordination and responsibilities of the institutions participating in logistic planning - therefore they are not instrumental and need redesigning. The new logistic planning procedures should take into account the present rôles, functions and responsibilities of all the institutions (military and civil) participating in logistic planning.

Important component of planning potential are computer systems supporting the planning processes.

There are systems which had been designed, worked out and implemented long before the restructurization started.

Some of them (still in use) have been designed for old generation computers. The decisions have been already made to modernize part of them and to cancel the other. There are also new systems processed on modern PC-s but dealing with logistic planning mostly on the lower levels (depot, region - logistic area, materiel and technical base). For the top levels: Logistics Planning Directorate, Materiel Directorate, Technical Directorate - of the General Staff as well as for Materiel and Technical Commands of Services - the new system has been designed on modular base (System LOGIS) which is actually in the phase of implementation (on IBM PCs 486) and in experimental use.

The fundamental component of the planning potential is however the mentioned above institutions' personnel - logistic planners and particularly their knowledge on NATO logistic planning principles, organizations, procedures and systems. This knowledge has been insufficient so far and needs completing education and training activities as well as translating into Polish the NATO logistic planning documents (handbooks, manuals and STANAGs) and popularizing the within logistic planners community.

### 3.3. Logistics planning preparation for integration with NATO

In comparison with the other spheres of military logistics described in the next paragraphs the importance and complexity of the planning preparation problems are much greater. The number of participating institutions and their mutual relations, the not finished so far restructurization process, not clear subordination and responsibilities, lack of new planning procedures adequate to the recent structural changes and insufficient knowledge on NATO logistic planning - result in inertia and false expectations that joining NATO will solve all those problems.

From 65 Target Force Proposals [58] received by Poland at the end of 1997 following have been selected by the Logistics Planning Directorate of the General Staff [29] and entitled as "Group of Planning and Organization Logistic Support Goals":

"TG4120 Logistics sustainability of units" (Priority I, Start Time 1999),  
 "TG4147 Logistics liaison personnel" (Priority I, Start Time IV 1999),  
 "TG4148 Logistics support planning/doctrine" (Priority III, Start Time 2002),  
 "TG4149 Logistics Reporting" (Priority III, Start Time 2000),  
 "TL0047 National support to Reaction Forces" (Priority I, Start Time IV 1999),  
 "TL0049 CS and CSS for Peace Support Operations" (Priority II, Start Time IV 1999).

The estimated costs of TG4120 – 3205 mln PLN (in prices from 1997), TG 4147 - 1 mln PLN, TG4148 - 14,48 mln PLN, TG4149 - 60 mln PLN.

This estimation is neither full not precise because of lack of the directive and standardization documents in the Logistics Planning Directorate of the General Staff.

To reach the Targets following activities have been determined.

For TG4120:

- preparing logistics personnel (II, 1998 - II 1999),
- preparing National Support Element (half 1998 - III term 1999),
- preparing group of logistics units for Reaction Forces (IV term 1999 – end 2000).

For TG4147:

- preparing logistics liaison personnel (half 1998 - end of 2000).

For TG4148:

- preparing personnel (half 1998 - end 1999),
- working out principles, manuals, regulations (2000-2002).

For TG4149:

- analyzing, interpretation and adaptation of NATO standards and documents concerning logistics reporting, and application in Polish military logistics reporting system, particularly in computer systems (IV term 1998 – end 2000),
- training personnel in using the new logistic reporting systems (IV term 2000 - end 2003).

For TL0047:

- preparing and starting the processes of creation and equipment processes of national logistic element (unit, brigade) or logistic units based on the logistic area potential (end of 1998),
- furnishing the subunits with necessary equipment and preparing standard stocks of necessary materiel (half 1999),
- training and exercises activities preparing the subunits of Logistic Brigade for operating together under the Brigade level command (from I to IV term of 1999),
- modernizing and replacement the old equipment of the battalions assigned to the logistic Brigade according to the document “Purchases Plan - to 2003” (from 1999 to 2000),
- furnishing the battalions of the Logistics Brigade with equipment and materiel stocks (from III term of 1999 to end 2000).

For TL 0049 fundamental activities have been already completed (according to the Logistics Planning Directorate).

These activities although important and required from the integration point of view do not reflect the fundamental integration problem of designing the transparent and clear procedure of logistic planning on the central level, taking into account the links with production logistics planning and CEP, NATO Stockpile Planning, HN issues as well as sending nation problems and participation in peace support operations.

This procedure should be coordinated and synchronized with NATO defence planning cycle.

### **3.4. Conclusion**

Taking into account the ideas and concepts presented in MC 319 (NATO Principles and Policies for Logistics) as well as in AJP – 4 (Allied Joint Logistic Doctrine) [14, 34] the following problems need solving during the integration process in the sphere of logistic planning:

- defining precisely and legally establishing the mutual relations, subordination, coordinating authority and responsibilities between the logistic Directorates of the General Staff, Logistic Branches of Services’ Commands and the Ministry of National Defence Departments participating in logistics planning processes,
- acquainting the top level logistics commanders, managers and experts with NATO Defence and Logistic Planning, particularly with the hierarchy of Alliance Planning (Defence Planning and Operational Planning, Force Planning, Logistic Planning, Armaments Resources, CIS Planning, OPLAN Development and Approval), Logistics Planning Process and Planning Tasks,
- preparing the team of designers acquainted with NATO Defence Planning Process, NATO Logistics Planning, HNS, CEP as well as with domestic logistics planning potential, procedures and supporting computer systems in order to work out the logistics planning procedure adequate to the resent situation (after the restructurization and taking into account the

lessons learned during participation in NATO planning process: DPQ, Target Force Proposals, Force Goals et.c.),

- redesigning the LOGIS system or introducing additional modules making it compatible with NATO computer systems supporting logistics planning as well as with NATO logistics reporting system,
- organizing the broad scale education of Polish logistics planning personnel on NATO logistics principles doctrine, organizations, procedures, documents, STANAGs basing on the potential of the Military University of Technology in Warsaw and corresponding NATO educational and training centers,
- designing, organizing and equipping the National Support Element (brigade size) and other logistics units for Reaction Forces,
- introducing the planning issues resulting from the integration with NATO into logistics training activities: command and staff exercises and field exercises,
- adjusting Polish logistics planning documentation used on lower levels (logistic area, logistic base, maintenance and supply depot) to NATO requirements and standards,
- acquainting personnel from the civil institutions, foreseen to participate in HNS and CEP, with NATO logistics planning principles, organizations and procedures.

## 4. SUPPLY

### 4.1. General remarks

Supply system as a part of Polish military logistics consists of so called “materiel system”, “technical supply system” and “major weapons supply system”. The influence of national economy conditions on these systems’ performance is greater than on other logistics systems.

The concept of supply system organization and functioning has evolved since 1992 (creating the logistics branch of the General Staff) from the idea of narrowly specialized supply organs (General Quartermaster’s Services: Clothing Service, Food Service; General Inspector’s of Technology Services: Tank – Automotive Service, Ordnance Service; supply branches of Army, Air Force and Navy; supply branches of Engineering Corps, Communications Corps and Chemical Corps) through the idea of centralized, versatile, full scale supply organs (Supply Directorate of the General Staff, Procurement and Delivery Department of the Ministry of National Defence) to the recent solution (instrumental since the end of 1996) within which the responsibility for supplying Armed Forces is shared between the Materiel Directorate of the General Staff (“materiel system”) Technical Directorate of the General Staff (“technical supply system”), corresponding Materiel Commands and Technical Commands of Land Forces, Air Force and Navy and the Procurement and Delivery Department of the Ministry of National Defence (“major weapons supply system”).

The Materiel Directorate of the General Staff is responsible for planning and programming activities in supplying the Armed Forces with 4 classes of materiel: food, clothing, POL and so called, “combat resources” (ammunition, rockets and explosives).

The Technical Directorate of the General Staff is responsible for planning and programming activities in supplying the Armed Forces with engineering, communications and chemical equipment, other technical equipment: stationary and mobile workshops, measuring instruments spare parts, repair assemblies and kits, tools, technical materiel. The adequate solution on the Land Forces, Air Force and Navy Commands level shares the responsibility for management the Services’ supply systems between corresponding Materiel Commands and Technical Commands (within the Services’ logistics branches).

The Procurement and Delivery Department of the Ministry of National Defence deals with supplying Armed Forces with major weapon systems and plays the rôle of a “bridge” between national economy (production logistics) and military logistics (consumer logistics) for other classes of supply. This rôle has been described in the paragraph “PRODUCTION LOGISTICS”.

This solution has not defined so far the rôle of Military Districts in supplying forces (recently the 4 existing Military Districts’ Commands have been subordinated to the Land Forces Command). The “Model 2012” assumes that the replanned two Military Districts only (NORTHERN and SOUTHERN or POMERANIAN and SILESIAN) will constitute the territorial logistics system but their future subordination (different options: to the Territorial Defence Directorate

of the General Staff, to the Land Forces Command or to the Department of the Ministry of National Defence) has not been decided so far.

#### **4. 2. Materiel System potential**

Materiel System potential consists of:

- supply platoons (sections) on the level of battalion (company),
- supply companies (supply sections, supply stores - in the Air Force and Navy) on the level of brigade (regiment and corresponding levels in the Air Force and Navy),
- supply battalions (supply depots - in the Air Force and Navy) on the level of division (corresponding levels in the Air Force and Navy),
- regional and Military District level supply bases on the level of corps, logistic area, military district, Services' commands,
- specialized supply depots on the level of Services' commands,
- ammunition delivery battalion on central level.

Practically every brigade (brigade level unit) has its own organic supply company (corresponding supply subunit) and every division (division level unit) has organic supply battalion (corresponding supply unit).

District and regional (logistic area) supply bases as parts of future territorial logistic system are in the stage of reorganization and forming.

The maintenance units, depots and organs described in next paragraph also participate in supplying processes dealing with technical materiel: repair parts and kits, repair assemblies.

Functioning of materiel systems consists of three controlled streams of materiel:

- the stream going through organic mobile supply and maintenance units and subunits (supply sections, platoons, companies, battalions) on particular levels of Armed Forces organization,
- the stream going through stationary (regional and Military District level) supply bases, maintenance depots as well as through specialized Services' depots,
- the stream of centralized (Procurement and Delivery Department of the Ministry of National Defence) and decentralized (different level commanders) purchases executed directly in the state-owned and private companies and enterprises of nationally economy .

From the integration with NATO point of view and particularly taking into account the HNS issues the important shortcoming of the materiel system is lack of sufficient autonomy of tactical level commanders in contracting admissible categories of goods and services on local markets (lack of legal solutions, principles, regulations, rules enabling the commanders to negotiate contracts and to cooperate with local civilian companies in the sphere of supplying forces).

### 4.3. Materiel System preparation for integration with NATO

Following assumptions have been determined so far in order to prepare the materiel system for integration with NATO and to implement the “Model 2012” of armed forces:

- introducing the new classification and codification of materiel,
- decreasing the number of mobile supply units, simultaneously increasing the effectiveness of the rest units as well as the capacities of territorial supply installations,
- increasing the materiel autonomy of tactical level,
- intensifying the works on stationary, territorial materiel system,
- creating new stationary regional (logistic area) supply bases of Land Forces, Air Force and Navy,
- adjusting the fuel supply system for the NATO requirements.

From 65 Target Force Proposals [58] received by Poland at the end of 1997 - three refer directly to the materiel system:

- “TG4080 Single Fuel on the Battlefield” (Priority III, Start Time 2000),
- “TG4081 Tactical Fuels Handling Equipment” (Priority III, Start Time 1999),
- “TM4093 Replenishment at Sea” (Priority II, Start Time 1999).

The Materiel Directorate of the General Staff estimated the total costs of TG4080 as 614 mln PLN and TG4081 as 213,20 mln PLN. The estimates have been supported by the detailed calculations, scheduling the costs year by year from 1998 to 2003 and taking into account the prices of necessary equipment and works.

Following detailed activities have been foreseen in order to reach the targets.

For TG4080:

- working out the technological documentation for production of the new fuels (1998 - end of 1999),
- working out and implementation the concept of supplying forces with new types of fuel (by the end of 2000),
- implementation the STANAGs: 1135, 3149 and 3747 - by the end of 2000.

For TG4081:

- starting the production and delivery of CD – 10 fuel tanks for the Reaction Forces (by the end of 2000),
- working out the concept of development and production of the remaining POL equipment (IV term 1998 - III term 2000),
- furnishing the armed forces with remaining POL equipment (I – II term of 2000),
- TG4081 will be executed also after 2003.

For TM4093:

- analysis of STANAGs: 2827, 2828, 2829, 2830, 2926 (by IV term 1998),
- estimation the loading and unloading capabilities in naval bases and civil harbours and furnishing the selected units with cargo handling and reloading equipment, signing contracts with civil carriers (from II term 1998 to the end of 2003),

- training the personnel operating the containers handling and reloading equipment (from II term 1998 to the end of 2003).

From the integration with NATO point of view following shortcomings of the materiel system should be taken into consideration:

- lack of computer – aided materiel planning system,
- the territorial stationary supply system still in the phase of organization with unsolved problems of the rôle and subordination of Military Districts,
- insufficient materiel autonomy on tactical levels (lack of legal regulations),
- the fuels and fuel supply system not adjusted to NATO standards and requirements,
- lack of containers based materiel distribution system and cargo handling and reloading equipment compatible with NATO standards,
- insufficient knowledge on NATO supply systems organization, principles, standards and procedures.

#### **4.4. Conclusions**

Among the basic functions of logistics - supply is the one within which the integration problems appear the most complex and the most important as well.

There are significant differences between the mobile (organic) and stationary (territorial) supply potential of Polish military supply system. While the first one doesn't need fundamental changes and is able to furnish materiel support for units operating in the field - inside the country and during the peace support operations - outside the country, the second (important from the HNS as well as from the NATO forces deployment point of view) still needs conceptual, structural and functional solutions.

In order to increase the compability and interoperability with corresponding NATO systems following activities should be intensified:

- designing the territorial supply system (particularly solving the problem of mission, rôles and functions of Military Districts as well as their subordination and placement within the territorial logistic system),
- strengthening the regional (logistic area) materiel bases (among others assigning certain mobile potential assets to shorten the time of delivery),
- designing the computer – aided materiel management system as well as C<sup>3</sup> system for stationary and mobile supply potential,
- modernizing the depots infrastructure (stores and warehouses equipment, handling and reoading devices) taking into account NATO requirements and standards,
- designing and implementing container based materiel distribution system,
- adjusting the fuel supply system to NATO standards and requirements (preparing the system for joining NATO Pipeline System, introducing fuels, lubricants and associated products standardization and interchangeability, solving the single fuel issues, furnishing forces with modern fuel storage and distribution equipment),

- introducing materiel classification and codification systems (acquainting the personnel with NATO standards and solutions),
- introducing the legal and organizational solutions giving more autonomy for tactical level supply system (providing tactical level commanders with rules and regulations enabling them negotiating and signing contracts with private and state owned companies and enterprises),
- organizing the education of the supply system management personnel on the issues of NATO Logistics Stock Exchange, Stockholding and Asset Requirements Exchange (SHARE), Common Item Materiel Management (COMMIT), Provisioning File Items (PROFIT) and NATO Ammunition Data Base (NADB), ACROSS system, Medium Term Resource Plan (MTRP) basing on the potential of the Military University of Technology in Warsaw as well as on NATO educational centers,
- intensifying the cooperation and increasing the participation of Polish military and civil supply specialists in the works of NATO institutions and organizations dealing with supply problems (SRB; NAMSO; NAMSA; NSO; PPC; NPC; CEPMA) as well as in working groups (AC/112/WG1; AC/112 ARMY, AVIATION, NAVY).

## **5. MAINTENANCE**

### **5.1. General remarks**

The basic armament of Polish Armed Forces have been manufactured in Poland according to the licence- and co-operation agreements (signed within the Warsaw Pact) or imported from the former USSR or former Warsaw Pact countries. It is generally obsolete, worn out morally and physically, difficult and expensive to maintain. Its low maintainability makes the fundamental difference between Polish and NATO's preventive services systems. Lack of modern diagnostic equipment and of the technologies of continuous assessment of state result in mostly based – on – lifetime maintenance with its all disadvantages versus the based – on – actual – state maintenance. The so-called Scheduled Preventive Overhauls System - in early Fifties introduced in Polish economy (as well as in the armed forces) following Soviet patterns - stil remains obligatory. Except certain theoretical assumptions and name - this system appears not similar to western PMCS systems (Preventive Maintenance Checks and Services).

The negative experience with the scheduled and obligatory overhauls executed after strictly determined periods of time and independently on the actual state of devices (which have significantly increased the maintenance costs) consists in appearing tendencies to artificially justified extension of the periods between services and overhauls in order to “spare” the maintenance costs in this way [47].

Within Polish military logistics the notion of Technical Support System is beeng used, which includes: Maintenance System, Evacuation System and Technical Supply System. These systems in the Armed Forces scale are supervised by the Technical Directorate of the General Staff and on the Services' Command level - by the Technical Commands within the logistics branches of Land Forces, Air Force and Navy Commands. On division (brigade) level there are Technical Departments (Sections) within logistics branches of division (brigade) commands.

Since 1994 the Technical Support System has undergone many transformations, the essence of which is changing the proportions between mobile and stationary maintenance and supply potential in favour of the last one. According to the defensive character of the new doctrine the damaged weapons and equipment should be evacuated to stationary maintenance depots, which belong to the territorial logistics system.

During the reorganization 30 brigade (regimental) level maintenance companies have been disbanded as well as 11 divisional maintenance battalions and 70 specialistic workshops (including vehicle service stations).

### **5.2. Technical Support System potential**

At present the Technical Support System potential consists of:

- maintenance platoons (sections) on the level of battalion (company),
- maintenance companies (technical flights, squadrons) on the level of brigade (regiment),
- maintenance battalions (field aviation workshops, naval technical workshops) on the level of division (corresponding levels in the Air Force and Navy),

- regional and Military District level maintenance depots, maintenance battalions and evacuation battalions (aviation maintenance depots and aviation workshops, ship maintenance points) on the level of corps, logistic area, military district, services' commands,
- maintenance battalions, heavy equipment transportation battalions, specialized medical and meteorological equipment maintenance depots, military and civilian maintenance and production enterprises.

Practically every brigade (brigade level unit) has its own maintenance company (corresponding maintenance subunit) and every division (division level unit) has maintenance battalion (corresponding maintenance unit).

District and regional (logistic area) maintenance depots as parts of future territorial logistics system (according to "Model 2012") are in the stage of reorganization and forming.

The functioning of land forces' maintenance system is based on three levels of repairs:

- current repair (small scale - to 16 work-hours - executed by maintenance platoon, middle scale - 16 - 40 work-hours - executed by maintenance company, 40 - 60 work-hours - executed by divisional maintenance battalion),
- middle repair (to 150 work-hours - executed by corps maintenance battalion or regional or district level maintenance depot),
- main repair – overhaul (450 - 4000 work-hours - executed by military maintenance and production enterprise).

In the Air Force the system is based on three levels of repairs of aviation technology:

- small repair (to 200 work – hours – executed by technical flight),
- current repair (400-600 work – hours – executed in the air base),
- middle repair (more than 600 work – hours – executed by military aviation maintenance enterprise).

In the Navy the system is based on two levels of repairs of ships:

- emergency repair (10-6000 work – hours executed by the ship crew or by naval technical workshop),
- battle – damage repair (small scale 7000-37000 work – hours, middle scale 14000 – 75000 work – hours, large scale 18000 – 112000 work – hours - all executed in ship maintenance points).

The analysis of actual potential and organization of technical support system shows that it needs fundamental changes from the perspective of future organization and equipment of armed forces, NATO membership requirements, new estimates of peacetime wear and battle-damage rates and executive capabilities of maintenance and evacuation systems.

### **5. 3. Technical Support System preparation for integration with NATO**

In order to implement the principles of the “Model 2012” of armed forces and to prepare the technical support system for integration with NATO following assumptions have been determined:

- introducing the five level classification of repairs according to NATO standards.
- decreasing the number of divisional maintenance battalions according to the structural transformation of land forces,
- mobile maintenance potential (brigade, division, corps – level) should fulfil the requirements for 1, 2 and 3 level repairs (mainly the weapon systems),
- the Military District and regional (logistic area) maintenance depots should execute the 4 level repairs, supplementing the field (mobile) potential,
- the military and civil maintenance and production enterprises should execute only the 5 th level repairs.

The new concept assumes following levels of repair:

- technical aid (to 16 work – hours, maintenance platoon)
- first level repair (16-40 work – hours, maintenance company),
- second level repair (16 - 40 work-hours, divisional maintenance battalion),
- third level repair (60 - 120 work-hours, corps maintenance battalion),
- fourth level repair (120 - 240 work-hours, Military District and regional maintenance depots),
- fifth level repair (450 - 4000 work-hours, military and civil maintenance and production enterprises).

The necessity of increasing the number of repairs in the stationary territorial maintenance depots and enterprises results in increased needs for technical evacuation potential which should be at last 4 times greater than the actual.

The fundamental changes in Air Force technical support system are connected with creating the two types airbases - on tactical level and on operational level and the air armament maintenance depot - on central level.

### **5. 4. Conclusions**

The concept of territorial based maintenance system (logistic areas, regional and Military District level maintenance depots) makes necessary moving part of maintenance potential from western to central and eastern part of the country – to make its territorial distribution more regular.

The consequence of assumed changes in the maintenance system organization will be necessity of transformation the technical supply system and particularly new composition and deployment of repair sets and kits stocks. Technical materiel assets should be organized on modular base providing the necessary autonomy of mobile maintenance units.

The adaptation to NATO maintenance standards needs solving numerous problems of technological and organizational nature as well as educational, research and even terminological.

Following problems should be solved at first:

- reorganization (according to the new described above rules) the maintenance systems of the units assigned to NATO,
- education of Polish maintenance specialists on NATO methods of estimating the battle damage and wear rates, techniques for assessment the damage, standarized maintenance and repair procedures, repair priorities systems, repair time lines, maintenance inspections, repair parts systems,
- acquainting Polish maintenance management personnel with NATO computer – aided maintenance management and planning systems, basing on the potential of the Military University of Technological in Warsaw,
- establishing the principles of technical support (maintenance, repair parts supply, technical evacuation) furnished for NATO forces deployed on the territory of the country,
- explaining (translating ), defining and popularizing the notions like: Battle Damage Assessment, Battle Damage Repair, Airfield Damage Repair, Cross – Servicing as well as LCC and CALS [51], within the military and civil maintenance community,
- acquainting the military and civil maintenance personnel with modern methods and equipment for automated testing of weapon systems technical state, nondestructive inspection, technical diagnostics, continuous assessment and control of devices' state,
- increasing the rôle and involvement of Polish Military University of Technology in education and research oriented towards solving logistical and particularly maintenance problems of integration with NATO as well as the cooperation of the University with corresponding NATO education and research centers,
- increasing the participation of Polish military maintenance management specialists in the works of NAMSO, NAMSA, working groups and panels oriented on maintenance problems,
- popularizing the experience and lessons learned by Polish maintenance specialists during participation of Polish battalion in IFOR and SFOR within peacekeeping operations “Joint Endeavour” and “Joint Guard” in Bosnia.

## 6. MOVEMENT AND TRANSPORTATION

### 6.1. General remarks

Since 1989 the military movement and transportation system has undergone fundamental changes. The Cold War strategies assigned Poland the rôle of “transit country” - particularly for Soviet follow – on – forces (second strategic echelon). The “heritage” of that approach is still visible not only in the transportation infrastructure but in organizations and institutions responsible for movement and transportation as well. The responsibilities were shared between military and civil institutions. The most important of them was one of the General Staff Directorates - The Directorate of Communication. The main sphere of interests of the Directorate was the railroad system of transportation troops and the term “Communication” was considered - in the narrow sense - mostly as railway or road transportation of troops - and subsequently, on lower organizational levels - separately from the movement (therefore the – mentioned – above Directorate had practically no executive organs below the Military District level and the institutions responsible for movement management and organization was Military Police).

Within NATO - movement and transportation are considered as fundamental components of mobility. The concept of mobility is cornerstone of the Alliance’s new strategy. Movement and transportation planning to support military operations should be carried out and coordinated on a combined service and joint military – civil basis encompassing all modes of transport. Joining NATO needs harmonization of legislation and other national measures appropriate to support Alliance movement and transportation capabilities. There occur also particular groups of problems connected with the differences between NATO – countries and Poland in transportation technology, possibilities of civil support to the military transportation, transportation resources acquisition policy, movement and transportation command, control and communications.

After disbanding at the end of 1996 the mentioned above Directorate of Communication - the Transportation Division has been created within the Directorate of Logistics Planning (in the General Staff).

The Transportation Division actually is supervising following activities:

- military railway transport and centralized transportation of supply,
- organization of cargo handling, trans – shipment and reloading works (including paletization problems),
- management of the equipment for reloading works mechanization as well as military railway rolling stocks,
- management the military payed fares and transportation charges problems.

The military railway sidings and side – tracks are supervised by the Ministry of National Defence’s Infrastructure Department. The Engineers Corps Command (within the Land Forces Command) is responsible for management and maintenance the transportation network from the technological point of view as well as for commanding the specialized maintenance and construction (railway, roads, bridges) military units (the so called communication units).

The responsibility for movement control and organization has been taken over by the Territorial Defence Directorate of the General Staff.

Within the logistics branches of Services' Commands (Army, Air Force and Navy) the Transportation Divisions have been created with responsibilities corresponding to the Transportation Division of Logistics Planning Directorate (General Staff) but specialized (depending on the Service) in supervising land, maritime and air transportation activities.

## **6.2. Movement and Transportation system potential**

As a result of organizational and structural transformations in 1989 – 1996 the movement and transportation system potential prepared for wartime has been reduced by 61% and the peacetime potential by 67% (from 61 to 20 units and organs). The number of assignments (civilian and military posts) has been reduced by 81%.

The important part of movement and transportation potential is supervised by the Infrastructure Department of the Ministry of National Defence. This potential consists of 2500 km roads prepared for movement of tracked vehicles, 60 railway stations prepared for military transport, 162 military railway sidings and side – tracks of total length about 800 km.

The so called communication units (regiments) subordinated to the Engineers Corps Command are responsible for reconstruction of roads, bridges and railway tracks and installations in the case of damages during the wartime as well as for maintaining the important from the military point of view elements of road and railway networks during the peacetime.

## **6.3. Movement and Transportation system preparation for integration with NATO**

Movement and Transportation system preparation for integration with NATO depends strongly on the determination of missions and rôles of Military Districts, which are not sufficiently precisely defined so far. Also the situation of Military Districts within the Defence System of the country and their subordination are not clear.

Perspective solution “Model 2012” assumes creating 2 Military districts (NORTHERN – POMERANIAN and SOUTHERN – SILESIAN) instead of actually existing 4 (POMERNIAN, SILESIAN, WARSAW and CRACOW) - subordinated to Land Forces Command. “Model 2012” assumes creating Transportation Divisions within the logistics branches of Military Districts Commands. Territory of the Districts will be divided into 2-4 Logistic Areas and in every Area the Military Transportation Command will be established with following responsibilities:

- supervising the execution of military railway and road transportation plans and cooperation with corresponding civil transportation supervising territorial organs,
- maintaining and updating the technological description of transportation networks from the military requirements point of view,

- control the transportation escort service and supervision hazardous materiel transportation,
- supervising the reloading (trans – shipment) area’s commands,
- supervising the usage of military transport equipment and assets.

From 65 Target Force Proposals [58] received by Poland at the end of 1997

- the two refer to the movement and transportation system:

“TG4134 Cargo Handling and Transportation” (Priority II, Start Time 2000),

“TG4150 Movement Planning and Co-ordination (Priority II, Start Time 2000).

Transportation Division of the Logistics Planning Directorate (within General Staff) estimated the total costs of TG4134 as 115,0518 mln PLN. The estimate has been supported by detailed calculations based mostly on prices of containers, containers trucks, reloading and handling equipment, modern cargo fastening and fixing devices.

To reach the Target following activities have been determined:

- adjustment logistics structures of divisions (brigades) of Reaction Forces to NATO cargo handling and transportation requirements by the end of 1999,
- providing necessary cargo handling and reloading equipment, containers, transport assets, cargo fastening and fixing devices for troops assigned to NATO - from 2001 to 2003.

The second Target TG4150 has not been considered by military logistics organs so far. Taking into account the ideas and concepts presented in MC336 (Transportation and Mobility Management Concept for NATO) [41], the fundamental shortcomings of Polish military movement and transportation system, from the integration with NATO point of view, are:

- insufficient co –operation between the institutions responsible for movement (Strategic Planning Directorate) and for transportation (Logistics Planning Directorate),
- lack of integrated computer-aided movement and transportation planning system,
- lack of procedures for coordinating land, maritime and air transportation activities,
- smaller than in NATO countries scale utilization of civil transport assets and equipment,
- handling and reloading equipment as well as cargo fastening and fixing devices not compatible with NATO standards,
- lack of supply transportation system based on containers and planning load sets and units,
- insufficient knowledge on NATO movement and transportation planning procedures and organization.

#### 6.4. Conclusions

There are still many factors which hamper the preparation military movement and transportation system for integration with NATO. To accelerate the integration processes following activities should be organized:

- developing education on NATO movement and transportation principles (MC336), policies, standards and organizations (AMCC, JMCC, TMCC) as well as on the computer systems supporting movement and transportation planning and management (ADAMS),
- increasing the participation of Polish military specialists in NATO movement and transportation organs: AMCC, JMCC, TMCC, SHAPE Movement Conference and working groups like MAG,
- precisely defining the responsibilities and principles of cooperation between different military and civil institutions participating in movement and transportation planning and management,
- designing the computer aided systems supporting movement and transportation planning and management compatible with corresponding NATO systems like ADAMS,
- acquainting Polish military movement and transportation specialists with the principles of organization and functioning of NMCC,
- verifying the types, sizes, dimensions of actually used paletized loads and containers from the NATO standards points of view,
- creating the military supply transportation system based on containers,
- equipping the units (in the first stage the units assigned to NATO) with container sets (as the beginning of creation container transportation system), handling and reloading equipment, cargo fastening and fixing devices,
- working out the military classification and codification system for transportation resources adjusted to NATO codification systems.

It is important to realize that within the actual solution the logistics organs are responsible for transportation system, whilst the movement control and technical maintaining of road and railway networks stay in the spheres of responsibility - relatively - the Territorial Defence Forces and Engineers Corps.

This solution needs participation of the Engineers Corps representatives in logistics management processes.

## 7. MEDICAL SUPPORT

### 7.1. General remarks

The restructuring of military medical service in Poland started in 1990 and the main tasks were carried out in 1994 – 1995. During the restructurization following medical units were disbanded: two military hospitals (TORU •, GRUDZI •DZ), one specialized military clinic (CZ•STOCHOWA), two military policlinics (WARSAW) and one medical materiel depot (CHE• M). The hospital departments of six medical battalions have been closed. The number of ambulatories and sick – rooms decreased (10%). The total number of cancelled positions was more than 430 military assignments and about 2500 civil ones. In the Military Medical Academy 199 career soldiers positions were cancelled (including 132 academic teachers posts), 435 cadets (students), 220 civil posts and 64 conscripts. The actual number of students of the Academy is 647. The total potential of the Academy decreased of about 38%. The Military Institute of Hygenics and Epidemiology has been included into the organizational structure of the Academy.

Within the veterinary service 30 regional centers have been cancelled.

Despite the mentioned above reductions the military medical care system in Poland meets the requirements of the downsized armed forces and actually does not need any significant organization changes.

### 7.2. Potential of the military medical service

The supervising institution responsible for medical care and medical support organization is the Directorate of Military Health Service (within the General Staff structure). The military medical service at present is responsible for providing medical care for about 1,1 mln people (2,8% of total population of the country) including career soldiers families and combatants as well as civil people (in regions where civil medical care system is not sufficient and weaker than the military one), The military medical potential makes 2,5% of the total country medical potential. This potential is located in 17 medical prophylactics and treatment areas. The military medical service employs about 15 thousands personnel 28% of which is military personnel. The military veterinary service (66 veterinary doctors) supervises 900 civil companies providing food for the armed forces. The actual number of 8 divisional medical battalions (every with hospital department) will be reduced by 2012 to 5. The “Model 2012” assumes the final number of 16 military policlinics and 20 policlinics in military hospitals - as the “open treatment” (out patient) potential and 5 clinical hospitals, 15 military hospitals - as the “closed treatment” (in hospital) potential.

The number of health resort (so called “sanatorium”) military hospitals will be 5. There will be also 5 sanitary – epidemiological stations and 4 centers of veterinary supervision. The total military treatment base for the wartime consists of 36 thousands beds. Additionally 365 civil hospitals on the territory of the country are able to provide 54 thousands beds for the Armed Forces.

The medical support system corresponds to the NATO standards defined by documents MC326 and ACE85-8 and consists of 4 levels of medical aid. The

medical materiel supply system provides 100% individual medical equipment for every soldier. Additionally medical subunits and units are holding stocks ready for medical help and treatment of 30% personnel. The medical materiel stocks assigned for hospitalization during the wartime provide 1 month treatment in the deployed bed base. Additionally the Regional Supply Bases are holding medical materiel stocks for the second month treatment for 12% deployed bed base.

Medical evacuation potential consists of organic evacuation assets of subunits and units. On the military district level there are 4 ambulances companies in every district and on the central level 4 battalions of medical evacuation buses.

### **7.3. Military medical service preparation for integration with NATO**

In Poland medical and health support is considered as a part of the military logistics system like in NATO HQ although this is not a reflection of most member nations military organizational structures where the medical service or staff is not normally part of logistics.

The main shortcoming of Polish military medical service in comparison with NATO requirements and practice is lack of air transport assets for medical evacuation. Except this issue which results from economic conditions, medical service is generally prepared for the integration.

From 65 Target Force Proposals received by Poland at the end of 1997 - two refer directly to the military service:

“TG4031 Medical Support Capabilities, Doctrine and Procedures” (Priority I, Start Time 2000),

TG4310 Biological Warfare Vaccine Sticks for Deployable Forces” (Priority II, Start Time 2001).

To reach the targets following activities have been determined:

- Implementation in the Armed Forces the Directive, AD85-8 [11] The Naval Medical Planning Handbook and actual STANAGs 2126 and 3242 determining: planning procedures, casualty rates, categories of wounded, the evacuation principles, the equipment requirements and blood requirements by the end of 1999;
- Improving the military medical service equipment according to STANAGs 2126 and 3242 by the end of 2000;
- Fulfilling the requirements of STANAGs 2939 (blood, blood products, equipment) and 2061 (patients distribution procedures) by the end of 1999;
- Vaccination Reaction Forces’ soldiers protecting against anthrax by the end of 2002;
- Legal regulations establishing the principles of assigning civil hospital base for the armed forces by the end of 1999.

Military Medical Service Directorate of the General Staff estimated the total costs of TG4031 as 354641 thousands PLN (including Army, Air Force, Navy and Central Organs needs) and total costs of TG4310 as 13110 thousands PLN. These estimates have been supported by detailed calculations of necessary materiel and activities’ costs.

The preparations have been initiated for cooperation with COMEDS and JMC as well as for the education and popularization of the MC326 [36] and AD85-8 [11] principles in order to prepare medical cadre for participation in working groups existing within JMC.

#### **7.4. Conclusions**

Although the Polish military medical service is generally well prepared for integration with NATO there are still important problems which should be solved to fulfil the medical compatibility and interoperability requirements taking into account the MC326 and other NATO medical support documents. They are:

- designing, organization and equipment of the medical evacuation system based on the air (helicopter) transport,
- adjusting medical supply rates, standards and procedures to NATO requirements (particularly in the sphere of blood and blood products, resupply of medical materiel, planning procedures, casualty estimation procedures),
- working out the principles of co –operation between civil and military medical services from the HNS point of view (taking into account the beginning privatization of medical centers, hospitals, pharmacies in Poland as well as the companies manufacturing medical materiel),
- improving medical service management and command (computer – aided medical planning, medical databases, medical service C<sup>3</sup> systems).

## 8. INFRASTRUCTURE

### 8.1. General remarks and basic notions

During the transition process the notion of “infrastructure” in Poland’s defence environment has undergone fundamental changes. The range of its previous meaning was limited to housing, accommodation and construction services. At present the so called “defence infrastructure” of the country is divided into “national economy defensive infrastructure” which is maintained by civil ministries (e.g. Ministry of Public Health and Medical Care, Ministries of Transport and Maritime Economy) and managed by Defence Departments of the Ministers - and “military infrastructure” maintained and managed by the Ministry of National Defence. Within the Ministry of National Defence the responsibility for the “military infrastructure” is shared between the Infrastructure Department subordinated directly to the Secretary of State - the First Deputy of the Minister of National Defence (The Department took over the tasks from the former Infrastructure Directorate of the General Staff), the Logistics Branch of the General Staff subordinated to the Deputy Chief of General Staff for Logistics and the logistics branches of Air Force and Navy subordinated to the Services’ Deputies Commanders for Logistics. The situation in Land Forces is not clear so far because the rôle of Military Districts (actually subordinated to the Land Forces Commander) has not been precisely defined yet.

The two new organs have been created responsible for the infrastructure in its former meaning: The Military Housing Agency and The Military Property Agency which started taking over the responsibility from respective Military Districts’ organs. Both are subordinated to the Ministry of Treasury. Actually the military infrastructure includes following objects: command centers, naval and air bases, stores, depots and bases of rockets and ammunitions, communications systems and devices, air defence system objects, logistics stores and bases, ranges, field training areas and centers, barracks complexes. The military infrastructure is composed of: general infrastructure, airfields infrastructure, naval infrastructure, transport infrastructure, training infrastructure and special infrastructure. The potential (possibilities) of the components will be described in next paragraph.

### 8.2. Potential of military infrastructure

The remainders of Cold War and Warsaw Pact era are still visible in the military infrastructure of Poland. Its potential is concentrated mostly in western and northern part of the country. The significant differences exist in the number of airfields, air defence system objects, communication system, barracks complexes between the north – western and south – eastern part of the country. Particularly important is lack of the infrastructure potential on the so called “eastern wall” - the about hundred kilometers wide stripe along the eastern border of the country.

The military infrastructure management and maintenance organs employ 16, 88 thousands persons including 1220 career soldiers and 15760 civilians.

General infrastructure, the destination of which is to assure the proper standards of troops accommodation and training facilities as well as to maintain the

real estate resources in the Ministry of National Defence administration, consists of: 256 garrisons, area of 293 thousand hectares (including 190 hectares of training area), total cubature 90 million <sup>3</sup>, 1800 compounds (barracks complexes). This potential allows to provide accommodation for 300 – 400 thousand soldiers, the garage stands for about 60 thousand vehicles, storage surface 3,3 million <sup>2</sup>.

Airfield infrastructure managed by the Airfield Infrastructure Division subordinated to the Air Force Deputy Commander for Logistics, consists of: 53 airfields (including 47 airfields with artificial surfaces), 2 airfields used jointly with the government owned enterprise “Airports”, 2 aviation training areas, 21 highway emergency landing strips, total ground surface 41992 hectares, 375 aircraft shelters, POL stores of total capacity 130000 <sup>3</sup>, 1 storage depot of the airfield equipment and material. There are also 2 airfield construction battalions.

Naval infrastructure managed by the Infrastructure Division subordinated to the Navy Deputy Commander for Logistics consists of: 3 naval bases (Gdynia, Hel, • winouj•ci e), harbour aquatories with total surface about 250 hectares (1,5÷9,0 depth), hydrotechnical constructions (piers) 17,88 km length (including 10,338 km completely prepared to the Navy standards), DC 220 V systems with 10000 A current intensity and water supply systems with capacity 810 <sup>3</sup>/h.

Transport infrastructure consists of: 2500 km roads prepared for movement of tracked vehicles, 60 railway stations prepared for military transport, 162 military railway sidings and side tracks of total length about 800 km.

Training infrastructure consists of: 12 training areas (190 thousand hectares) with about 120 objects of total cubature 226 thousand m<sup>3</sup>, 322 garrison shooting ranges, 257 fire training squares, 135 tactical tracks, 65 tank movement training areas, 87 combat grenade ranges, 1100 centers of special training (physical, fire – tactical, chemical, parachute, engineering, river crossing, reconnaissance etc.) It is possible to accommodate about 7300 soldiers in the stationary facilities of the training areas.

Special infrastructure consists of special fortified objects and shelters: command posts, communications objects, air defence system objects, alert systems and other.

### **8. 3. The infrastructure preparation for integration with NATO**

The basic areas of infrastructure preparation for integration with NATO are: Host Nation Support, NATO Security Investment Programme (NSIP), Capability Packages and preparations of the military objects in the city Szczecin for the planned location of the Multinational (German, Danish, Polish) Corps HQ.

Host Nation Support. According to DPQ and to the Target Force Proposals actually received by Polish Armed Forces following objects should be prepared by the end of 1999: 2 military airfields (MALBORK, POZNA• KRZESINY), 2 naval bases (GDYNIA, •WINO UJ•CIE), 2 depots (CYBOWO, PRZEWÓZ – POTOK).

By the end of 1999 these objects should achieve the required level of interoperability.

The detailed problems of the mentioned above airfield interoperability are for instance:

- increasing flow capacity of air fuel distribution systems to 2500 liters per minute,
- equipping the airfields with aircraft arresting systems,
- providing the airfields with modern radio correspondence equipment,
- marking the airfields surfaces according to NATO standards.

The exemplary detailed problems of naval bases interoperability are:

- equipping the bases with unified terminals for supplying the ships,
- installing the required bumping devices,
- providing the bases with modern frequency converters.

NATO security Investment Programme. In order to prepare military infrastructure for participation in NSIP number of common activities with NATO HQ and SHAPE have been introduced into the Partnership Work Programme for 1998-2000 concerning the preparation of specialists teams and appropriate structures for performance the NSIP tasks. In this programme a round of familiarization - training meetings with SHAPE infrastructure experts have been foreseen aiming at preparation of Polish side to the participation in NSIP in terms of personnel training and required structure creation. The plan also includes the identification of investment activities eligible for implementation within the NSIP framework and their submission to NATO HQ for authorization. A document of the NATO Common Infrastructure and on selected issues of NSIP including a draft concept of Polish participation was prepared and sent to appropriate civilian ministries which have been foreseen to participate in implementation the tasks connected with this programme.

Capability Packages. The notion of Capability Package still needs assimilation in the circles of Polish logisticians as well as the phases of the CP process (definition, submission, approval, implementation). A Capability Package as a combination of national and NATO – funded assets and support facilities which together, will enable a NATO Commander to fulfil a specific NATO military function or requirement - needs the knowledge on the links between the military common resources and the NATO Defence Planning Process. This knowledge within the circles of Polish logisticians is not sufficient enough to identify the infrastructure requirements, to define the common funded operation and maintenance costs, to formulate the investment requirements either for new installations or to satisfy shortfalls in existing installations. The notions of Principal Military Requirements (PMR), Military Functions (MF) need also familiarization.

Multinational Corps HQ. The Multinational Corps with its HQ located in SZCZECIN is currently under organization according to the trilateral agreement of German, Danish and Polish Ministries of Defense. The representatives of the Infrastructure Department of the Ministry of National Defence participate in the infrastructure working sub – group activities. The first adaptation works for the planned Corps HQ location started in April 1998. The total estimated adaptation costs of the barracks are approximately 56 mln PLN that is about 16 mln \$.

## 8.4. Conclusions

The modernization of Polish military infrastructure has been actually limited to selected elements only which are connected with the interoperability. This is the result of decreasing the defence budget and military expenditures. To improve the management of the budget resources the decreasing of total cubature resources (about 35%) is expected (and military areas about 20%). It will reduce the maintenance costs about 12-15%. There exists the plan to suppress above 80 garrisons and to reduce next 50.

The technical wear of the military infrastructure objects is relatively high (about 25%) and particularly the buildings used directly for the accommodation of troops (kitchens, messes). Some of those objects have been used and rebuilt since more than 100 years and they differ in construction solutions applied and the equipment standards. More than 2/3 of the cubature objects (particularly boiler houses and sewage – treatment plants) need repairs, overhauls and 1,5% (1,3 mln m<sup>3</sup>) have been qualified for demolition. This is the result of long lasting underinvestment. Particularly the objects used by former Soviet army need repairs and overhauls. The repairs' and overhauls needs result also from the necessity to adjust military infrastructure objects to the new requirements of environment protection. The estimated costs of maintaining the military real estate objects are about 600 mln PLN per year. There is significant difference between the actual repair expenditures (1,04 PLN per 1 m<sup>3</sup> of cubature) and the required (3,84 PLN per 1 m<sup>3</sup> of cubature).

According to NATO requirements Poland should be able to provide accommodation for at least one corps of NATO forces during one year. Actually the barracks infrastructure is able to accommodate 40 thousands of allied forces.

The airfield infrastructure needs also repairs and overhauls (the costs of which are estimated about 1,5 mld PLN and 11,2 mln PLN for modernization the highway emergency landing strips). The maintaining of military airfields requires expenditures about 200 mln PLN per year. The average age of the airfields basic equipment is 12,6 years (the durability standard is 15 years).

The fundamental problem of the airfield infrastructure from the integration with NATO point of view is the interoperability of fuel supply systems. Those systems - mostly designed in the fifties and sixties and then modernized need many changes.

Polish military planes are actually being supplied with typical air fuel JET-A1, which is transported directly from the petroleum refineries by railway tanks. The first step of the supply process - the unloading lasts too long (6 railway tanks with 60 m<sup>3</sup> capacity take about 4 hours) in comparison with NATO air bases where the unloading stage is similar but takes less time thanks to the greater number of unloading terminals, greater delivery of fuel pumps and diameter of pipelines. The next stage of the supply process - storage is similar to corresponding NATO solutions (the underground fuel tanks mostly in good technical state) but there is significant difference resulting from the necessity for special treatment of the air fuel (addition the water inhibitor) which takes about 2 hours whilst in NATO solutions the inhibitor is added in refineries or injected directly to the airfield pipeline system. The fuel filters used on Polish military airfields provide fuel

purity acceptable by NATO but the delivery of centrifugal pumps (used on Polish airfields) is not sufficient and the intermediate pumping process is hand controlled whilst in most NATO airbases this process is automatically controlled. The last stage of the supply process the distribution is similar from the technological point of view but there are differences in distributors efficiency and in distribution procedures.

The naval infrastructure with the average age of constructions 40-60 years needs also significant repair and overhaul activities. Particularly the breakwaters and wharths in naval bases GDYNIA, HEL, • W INOUJ•CIE need repairs and overhauls. The lack of mobile power supply systems (more than 250 KVA) makes servicing ships in smaller harbours difficult.

The training infrastructure needs also additional expenditures estimated about 97 mln PLN (including 18,7 mln repair costs, 5,8 mln environment protection costs, 72,5 mln additional investment in modernization).

The determination of further detailed tasks for Poland's military infrastructure systems related to the integration with NATO should be derived from operational requirements resulting from NATO Force Goals as well as from the Host Nation Support and Civil Emergency Planning requirements.

## 9. PRODUCTION LOGISTICS

### 9.1. General remarks

According to the Fellowship Agreement and Application Form (Annex 2) the goal of the Project concerned the military logistics system only, for which the corresponding NATO term is “Consumer Logistics” or “Operational Logistics” (including reception of the initial product, storage, transport, maintenance including repair and serviceability, operation and disposal of material [51]) but after taking part in numerous meetings with NATO representatives and particularly in the one week seminar entitled “US – Poland Bilateral Logistic Information Exchange” including the exercise “Operation Stable Peace” held in Warsaw in May 1998 and devoted to the preparation of Polish logistics systems for supporting NATO peaceenforcing and peacekeeping operations [59] - the author decided to include additionally the issues concerning “ Production Logistics” also known as “Acquisition Logistics” dealing with research, design, development, manufacture and acceptance of materiel [51].

Historically the arms procurement environment in Poland evolved from the relative autonomy of Arms and Services Commands in the Fifties to the full scale monopolization and centralization in Sixties – Seventies, which expressed itself in creating the office of military Vice Minister of National Defence – General Inspector of Technology and subordinated to him military Directorate of Procurement and Delivery of Military Technology. After restructuring the Ministry of National Defence in 1993 and creating the Civil Branch of the Ministry - the leading rôle in arms procurement environment plays the Procurement and Delivery Department of Weapon Systems and Military Equipment subordinated to the civil Secretary of State - the First Deputy of the Minister of National Defence. To certain degree The Department is the successor of the former Directorate of Procurement and Delivery of Military Technology. Decisions are worked out in the Department in coordination with so called Central Logistic Organs (logistical directorates of the General Staff and Services’ Commands) and finally approved by the civil Minister of National Defence. The recent (end of 1996) reorganization of the Ministry of National Defence has fundamentally changed the competences and responsibilities of the General Staff and subsequently the rôles of its logistical directorates. The influence of the last changes on the arms procurement decision making process has not been determined so far. Simultaneously at the end of 1996 the new Ministries have been created - among others the Ministry of Economy uniting the functions and rôles of several central offices (e.g. the former Ministry of Industry, the former Central Planning Office). Within the Ministry - the Department of National Reserves and Defence Affairs has been created so far but its responsibilities are still not determined. The Ministry of Treasury is the second newly created (end 1996) central office which probably will play important rôle in the procurement process (with Defence Affairs Bureau in its structure). There has been also created the Military Bureau within the new Governmental Center for Strategic Analyses. The rôles of the new Ministries and offices in the arms procurement decision making have not been defined yet as well as the rôles of three central foreign trade enterprises:

“Cenzin”, “PEZETEL” and “NAT” - so far the main deliverers of weapon systems and military equipment for the armed forces.

Although the legal status and structure of the organizations differ among each other (“Cenzin” and “PEZETEL” are joint stock companies with State’s Treasury participation; “NAT” is private company) their operations on weapons market are similar - they tend to be the only mediators between the State’s procurement organs and arms manufacturing companies. This creates opportunity for them to control the weapons market in Poland.

The first important legislative solution - the Public Procurement Act appeared in June 1994 [48].

The seventh article of the Act creates the Public Procurement Office, President of which subordinated directly to the Prime Minister of Polish Government is the central organ of state’s administration responsible for public orders system in Poland. This places the Public Procurement Office at ministerial level within the organization of the government. The Public Procurement Act has determined the sphere of activity of the President of Public Procurement Office only without saying precisely on the missions and responsibilities of the Office itself.

The Public Procurement Act has been compulsory since July 1994 and has been already amended twice. Its shortcomings have become apparent soon. The experiences gathered so far allow to formulate certain conclusions on the needs for further changes as well as on the actually applied arms procurement decision making procedure.

## **9. 2. The actual arms procurement decision making procedure**

The procedure consists of two stages: Planning Stage and Executive Stage. Planning Stage is composed of five sequential steps. Executive Stage consists of twelve separate procedures worked in order to deal with particular “procurement situations” according to the Public Procurement Act and following its instructions issued by the Government.

The organizations involved in the current process of arms procurement decision making are:

- General Staff which works out “The Chief of General Staff Guidance for the Materiel - Financial Planning in the Armed Forces”;
- The so called “Central Logistic Organs”: Services’ Commands and selected directorates of the General Staff: Materiel Directorate, Technical Directorate, Military Medical Service Directorate, Logistical Planning Directorate as well as so called Weapon and Equipment Disposers: Branches Commands within the Service Commands - they all participate in working out “The Requirements Specifications for Weapon Systems and Military Equipment Procurement and Maintenance and for Research Works and Implementations”;
- Procurement and Delivery Department of the Ministry of National Defence, Research and Implementations Department of the Ministry of National Defence work out two annual plans: Weapon Systems and Military Equipment Procurement and Maintenance Annual Plan” and “Research Works and Implementations Annual Plan”;

- Secretary of State - First Deputy of the Minister of National Defence and the Chief of General Staff who accept the above mentioned Plans;
- Minister of National Defence who approves the Plans.

The Plans approved by the Minister of National Defence constitute the basis for starting the executive procedures by the Procurement and Delivery Department of the Ministry of National Defence as well as the research and implementations procedures in the military research centers and institutes supervised by the Research and Implementation Department of the Ministry of National Defence which supervises and gives financial support for qualification examinations and tests of weapons and military equipment in the centres and institutes.

After fundamental changes of the Government structure (creating new ministries and central offices and the new structure of the Ministry of National Defence) at the end of 1996 the planning routines of the first stage need to be reworked.

The common expectation the “crucial” moment of joining NATO is one of the reasons for the “*festina lente*” philosophy.

All the second stage procedures start from the analyses of the “Weapon Systems and Military Equipment Procurement and Maintenance Plan”. If the single procurement exceeds 20 thousands ECU the announcement is published in “Public Procurement Bulletin” and if it exceeds 200 thousands ECU - in “The Official Journal of European Communities (in particular cases The President of Public Procurement Office may decide not to publish the announcement). In every executive procedure of the second stage the main decision making body is “commission” composed of at least five persons appointed by the Director of the Procurement and Delivery Department of the Ministry of National Defence. Additionally when the contract exceeds 50 thousands ECU representatives of the Supervision (Inspection) Department of the Ministry of National Defence, Parliamentary Committee of National Defence and Military Information Services are invited to take part in the “commission” works.

This body opens the offers and checks if the tenderers fulfil formal requirements of the Public Procurement Act and then starts separate negotiations with every tenderer on the contents of the offer, price, terms of proposed contract agreement, possible technological changes. Finally the “commission” selects the offer (or decides not to select the offer) and informs the selected tenderer on the decision and on the appointed time of signing the contract. If the value of the contract exceeds 50 thousands ECU it should be signed by the Deputy Director of the Procurement and Delivery Department and if the value exceeds 800 thousands ECU - by the Director of the Procurement and Delivery Department and in every case by the Chief Accountant of the Department.

### 9.3. Defence industries

On May 19, 1992 Polish Government carried a vote on reorganization of Polish defence industries. Numerous controversies and critique started from the very first days after the resolution. The questionable governmental decision was the result of the three year reorganizational process running in a complex environment of total transition of the state and the conversion from totalitarian to democratic models in both policy and economics.

The needs for the reorganization of Polish defence industries resulted from the rapid decrease of Armed Forces orders and the collapse of weapons export. As recently as the second half of the 1980s, the geopolitical situation stimulated the boom in the arms manufacturing industries in the world, but the restraint of the arms race, decreasing orders from the Third World countries and the rigors of economic policy in Poland at the end of the 80s forced the necessity of production size adaptation to the sudden drop in demand.

For the Polish arms industries, the crucial year was 1988. At the beginning of the year, one half of the final production was delivered to the home and other Warsaw Pact countries armed forces, whilst the second part was exported mostly to the Close and Far East weapons markets. At the beginning of 1989, it became obvious that the drop in demand would be prolonged, and that without fundamental reorganization the arms industries would not survive.

The reorganization started in 1990 and encompassed: downsizing the individual enterprises, downsizing the sector itself, conversion.

According to the decisions of the former Ministry of Industry and Trade and the Ministry of National Defence the enterprises could expand its civil – oriented production (simultaneously decreasing the military – oriented one) - which resulted in using only 18% of their total productive capacity for military – oriented production in 1992.

In 1995, about 150 companies participated in the production of arms and military and logistic equipment (together with the so-called “special production”). Most of these enterprises were suppliers or coproducers of goods for civil markets. The core of the military industry consisted of 31 companies which were supervised by former Ministry of Industry and Trade. They handled 90 percent of all the orders placed with the defence industries by the Ministry of National Defence and other contractors of special production. The Ministry of National Defence supervised 13 companies, which provided repair and overhaul services for arms and military equipment. Other 23 companies carried out orders from the Ministry dealing with goods of general application.

In 1989, 128 firms had enjoyed the privileged status of being termed “special production enterprises”. Of those, 39 manufactured military equipment as final product. The remaining 89 focused their activities on dual – use products, supplying the market in addition with services of different kinds e.g. overhauls.

As yet the ownership status of defence industry has been transformed from state – owned companies into joint – stock companies owned by the State Treasury as a dominating shareholder - that means they have been only prepared for privatization - but they are still far from privatization.

Fundamental difference between the state-owned company and the joint stock State Treasury company consists in the division of the total capital owned by the latter into so called “shared capital” and “reserve capital”. The “shared capital” is then divided into nominal shares. The participation of State Treasury in this “shared capital” should be non less than 51%. The remind number of shares should be prepared for sale on the principles established by the Supervisory Council of the joint – stock company taking into account the priority for the company employees in buying the shares. The authorities of the company are: General Assembly, Supervisory Council and Directorate (executive authority). In the Supervisory Council the state’s government as well as the crew of the company should be represented. The term of the office is usually one year. The General Assembly gatherings may be initiated by the Supervisory Council, the Directorate and by the share holders owing (usually) at least 1/10 of the “shared capital”. The General Assembly elects the representatives of the crew – members of the Supervisory Council, establishes the value and the price of a single share and also makes decisions on increasing the number of shares (emission new shares) but the decision should be approved by adequate state’s minister.

The 88 enterprises which lost their status as defence industry units from 1989 to 1995 were transformed into joint – stock companies belonging to the State Treasury. In 63 of these cases, the State Treasury then sold part of the shares to private investors. The inflow of private capital subsequently helped to modify production including replacement of special production by goods for the civil market.

Of the 31 companies, considered the core of defence industry 28 were transformed into State Treasury joint – stock companies. The State Treasury was the sole owner, except for 20 percent of the shares which belonged to the company staff, as regulated by the law of ownership transformation.

The situation influences strongly the interface between the military supply system and defence industries - although going slowly the privatization process in Poland has already broken cooperative links between the enterprises which previously participated in the centrally – planned weapons and equipment production (the new companies owners have closed the departments manufacturing details and parts of weapons and military equipment - this production has appeared unprofitable) - so the lack of spare parts has become the nightmare for Polish military logisticians. The same refers to the spare parts and assemblies imported from the countries - former members of Warsaw Pact.

This situation strongly interferes with supply planning, stockpile calculations, sustainability issues, maintenance and repair activities - and results in limited forces training and exercises.

#### **9.4. Conclusions**

Poland like most other European countries cannot abandon the production of arms and military equipment completely, even though it does not always correspond to the criterion of the economic effectiveness. Integration with NATO creates unique opportunities for Polish defence industries. Since the establishment

of the Alliance, extensive coordination and cooperation in the field of armaments has taken place within NATO.

To meet NATO challenges in armaments cooperation Poland should:

- clarify the status of defence industry and its situation within national economy,
- make transparent the relations between state – owned, joint – stock and private companies manufacturing weapons and military equipment as well as the relations between acquisition logistics and operational logistics,
- estimate the potential of defence industry which could be assigned to take part in NATO's armaments cooperation,
- prepare the proposals of participation in NATO's common armaments programmes,
- prepare civil and military specialists for participation in CNAD works and in its groups, subgroups and working groups as well as in the NATO project steering committees and NPLO (language training, knowledge on NATO structures and procedures),
- make Polish creators and executors of weapons systems and military equipment procurement plans acquainted with NATO procedures for armaments cooperation - particularly with the systems: PAPS and CAP (AAP-20, AAP-27), Guidance on Integrated Logistics Support for Multinational Equipment Projects (ALP – 10) [3, 4, 17],
- synchronize the arms procurement decision making procedures and planning with corresponding NATO planning processes,
- increase the knowledge on NATO standardization among Polish civil and military defence engineering community (introducing standardization issues into the academic programs in military schools and universities),
- prepare the quality control cells in Polish defence industry enterprises to apply NATO quality control standards,
- popularize CALS and LCC problems within Polish defence industry community,
- acquaint the specialists employed in the Defence Departments of Civil Ministries with Civil Emergency Planning and Host Nation Support problems and increase their participation in NATO organizations: SCEPC, IPC, FAPC.

## GENERAL CONCLUSIONS

In 1964 author of this report served as second lieutenant - platoon leader in SAM – 2 unit. The first “logistic” task he received was to make the spare parts requirements’ plan for anti-aircraft missiles guidance radar. The basic principle used to determine the number of particular type spare parts required was the “proportionality principle” i.e. the number of required type spare parts was “proportional” to the number of this type parts working in the radar station. When in 1994 (after 30 years) the decision was made on withdrawing SAM – 2 as obsolete, worn out physically and morally the statistics of the parts failures was sufficient enough to base the spare parts requirements’ plans on the lifetime – oriented methodology.

In 1994 Logistics Institute started designing the logistics system for the newly created (within Polish Armed Forces) air mobile units (the 25-th Air Cavalry Division). The design problem appeared the typical two-criterial problem. In the sense of the “autonomy” or “self-sufficiency” criterion - the air cavalry units should be equipped with logistic potential providing necessary level of self-dependent sustainability (providing possibility of conducting combat operations separately from the main forces or on the territory occupied by the enemy). In the sense of the “mobility” criterion - the air cavalry units should not have excessive logistic trains cramping its manoeuvre ability.

These two examples of the “low level” logistic problems reflect in reduced scale the present day dilemmas of Polish military logistics. On one hand maintaining the obsolete basic armament (manufactured according to the licence agreements or imported from the former USSR or former Warsaw Pact countries) and necessity of holding minimum stock levels of spare parts, repair kits, maintenance materiel for the armament - on the other hand - lack of joint logistic doctrine and subsequently - Services’ logistic doctrines and the atmosphere of waiting for NATO’s assumptions on future missions and tasks of Polish Main Defence Forces, waiting for modern weapons systems and equipment, waiting for guidance and assumptions necessary to determine the orientation of infrastructure or to establish the proportions between mobile (organic) logistic potential and the stationary (territorial) one.

In order to evaluate the actual status of Polish military logistics in comparison with selected NATO countries and other Central European countries we used expert estimates basing on the statistical method of point - estimation. We asked military experts from different institutions: logistic commands and staffs, academic centers, military units to express their opinions (filling specially prepared questionnaires) on four questions: logistic doctrine (precision of formulating, level of satisfying armed forces needs within the existing doctrine), logistic support organization and management, spheres (functions) of logistics (supply, maintenance, transportation medical), infrastructure. We applied the 10 point scale of estimation (0 – the worst estimate, 10 – the best one). After statistical processing the experts’ answers, following results have been obtained.

The Polish logistic doctrine has been estimated on the level 4,08 point (comparatively: German 9,34, French 8,53, British 8,37, Czech 6,27, Hungarian 6,00). According to the verbal experts' opinion the Polish logistic doctrine estimate is low - it is worse than the one of NATO countries as well as the other Central European countries, applicants for NATO membership.

The similar estimate concerns the logistic support organization and management - Poland 3,44 points (Germany 9,00, France 8,44, Great Britain 8,36, Czech Republic 6,04, Hungary 6,30).

The relative estimate of basic functions of logistics is - for Poland 4,00 (Germany 9,00, France 8,00, Great Britain 7,68, Czech Republic 5,87, Hungary 6,00).

Also the infrastructure estimate in relation to other countries is low - Poland 3,84 (Germany 9,51, France 8,66, Great Britain 8,45, Czech Republic 6,58, Hungary 5,73).

The full joint estimate of the military logistics system needs taking into account all the four components.

In order to obtain the estimate following weight coefficients have been estimated by experts, expressing the influence or participation of particular components in the general estimate of the logistics system:

logistics doctrine - 0,226,

logistics support organization and management - 0,275,

spheres (functions) of logistics - 0,230,

infrastructure - 0,269.

Using the mentioned above coefficients the general estimate of Polish military logistics system has been calculated as 3,82 (Germany 9,04, France 8,42, Great Britain 8,23, Czech Republic 6,20, Hungary 6,01).

According to the experts' opinions expressed during informal discussions and talks the main sources of the low estimate of Polish military logistics system are: the not finished organizational solutions (particularly concerning territorial logistics subordination, insufficient budget resources, underinvestment, lack of firm and transparent logistics policy).

The total costs of securing the Force Goals concerning military logistics by the year 2003 have been estimated as 4.700 mln PLN.

Taking into account the conclusions that have been formulated at the end of particular chapters of the report as well as the presented above experts opinions and discussions during the first seminar "US-Poland Bilateral Logistics Information Exchange" in May 1998 we tried to generalize the conclusions and to specify and prioritize the problems which should be solved from the integration with NATO point of view. The ranking of the problems is following.

1. Establishing the principles of subordination, coordinating authority and sharing responsibilities between the logistic branches of central level institutions (Ministry of National Defence Departments, General Staff Directorates, Services Commands).
2. Designing the transparent logistics planning procedure with precisely defined roles of central level institutions and taking into account the requirements of NATO Defence and Logistics Planning Processes, HNS,

CEP as well as the necessary co-ordination and synchronization of Polish and NATO procedures.

3. Designing the territorial logistics system based on the idea of logistic areas, solving the problem of missions, rôles and functions of Military Districts as well as their subordination and logistic responsibilities.
4. Creating the educational and training system (based on the Polish and NATO military education and research potential) preparing Polish military logistics personnel for participation in NATO logistics organs and for the co-operation with NATO institutions, commands and staffs.
5. Modernizing the military supply system (depots infrastructure, materiel handling and reloading equipment, container based distribution system, fuel supply system) adjusting it to NATO standards and requirements.
6. Reorganizing the maintenance systems of the units assigned to NATO, establishing the principles of technical support (maintenance, repair, spare parts supply, technical evacuation), increasing the participation in NAMSO, NAMSA, maintenance oriented working groups and panels.
7. Precisely defining the responsibilities and principles of cooperation between military and civil institutions participating in movement and transportation planning and management, increasing the cooperation with NATO movement and transportation organs, designing computer aided systems supporting movement and transportation planning and management corresponding with NATO's system ADAMS.
8. Designing and developing medical evacuation system based on the air transport, adjusting medical supply rates, standards and procedures (particularly in the sphere of blood and blood products )to NATO requirements, working out the principles of the co-operation between civil and military medical services from the HNS point of view.
9. Preparing the team of researchers and designers (with participation of NATO specialists and experts) in order to study the directions of infrastructure development from the future missions and tasks of Polish Armed Forces within NATO strategic and operational concepts and plans as well as to design necessary infrastructure objects and systems.
10. Establishing the placement and legal status of defence industries within national economy, increasing the participation in CNAD works, educate civil and military specialists in PAPS, CAPS, CALS and LCC problems, synchronizing domestic arms procurement procedures and palnning with corresponding NATO procedures, increasing the education on NATO standards and quality control requirements in Polish defence industry companies and enterprises.

It would be useful to continue the studies and research works which have been already initiated within this project but with increased participation of NATO logistics experts in order to trace the future progress of integration, to detect and define the new arising problems, to estimate currently the reached level of integration in particular spheres of military logistics. In the case of continuation the research closer co-operation would be necessary between the Logistics Institute and corresponding NATO's educational and research centres. The Institute is ready and

sufficiently prepared to meet the challenges of broad education of Polish military and civil logisticians on NATO logistics and on logistics integration problems with participation of NATO lecturers and experts. There exists also the possibility of acquainting NATO specialists with detailed problems of Polish military logistics important from the integration point of view.

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