

**FINABEL COORDINATING
COMMITTEE**

Quartier Reine Elisabeth
Rue d'Evere
B-1140 BRUSSELS

Tél Col : 02/701.41.04
Tél Cdt : 02/701.41.03
Tél Srt : 02/701.68.24
FAX : 02/701.71.78
E-mail : finabel@mil.be

29 November 2008

FIN/SEC/27.260-G

DISPATCH NOTE

SUBJECT	Promulgation of report Finabel Nr G.26.R
TITLE	LOGISTIC FORCE PROTECTION ON A MULTINATIONAL OPERATION; HOW TO INCREASE PROTECTION OF LOGISTIC CAPABILITIES OF FINABEL NATIONS DEPLOYED INDIVIDUALLY OR COLLECTIVELY ON OPERATIONS.
REFERENCE	FIN/SEC/27.249-G dated 29 August 2008
OBSERVATION	The above-referenced document may be destroyed.

(Signed) Colonel NOËL J.
Head of Finabel
Permanent Secretariat

Promulgation of report Finabel Nr G.26.R

**LOGISTIC FORCE PROTECTION ON A MULTINATIONAL
OPERATION; HOW TO INCREASE PROTECTION OF LOGISTIC
CAPABILITIES OF FINABEL NATIONS DEPLOYED
INDIVIDUALLY OR COLLECTIVELY ON OPERATIONS.**

DATE OF PROMULGATION : NOVEMBER 2008



Table of contents

0. BIBLIOGRAPHICAL DATA STUDY G.26.R

1. INTRODUCTION

- 1.1. Aim and Purpose
- 1.2. Areas covered
- 1.3. Limitations
- 1.4. Period of Validity
- 1.5. Reference Documents

- 1.5.1. NATO Documents/Allied Papers

- 1.5.2. Finabel Documents

- 1.6. Definitions

2. LOGISTIC AND MEDICAL SERVICE CAPABILITIES IN FUTURE OPERATIONS

- 2.1. Logistic Forces and Capabilities in Future Operations
- 2.2. Medical Service Capabilities in Future Operations
- 2.3. Tasks of Logistic Forces and Medical Services in Future Operations

3. THE THREAT

- 3.1. General
- 3.2. The Threat Spectrum
 - 3.2.1. The threat by infantry weapons
 - 3.2.2. Shoulder-fired anti-tank weapons
 - 3.2.3. Mortars
 - 3.2.4. Rocket artillery
 - 3.2.5. Tube artillery
 - 3.2.6. Combat drones and UAV (model airplanes included)
 - 3.2.7. Man-portable air defence weapons (MANPAD)
 - 3.2.8. Mines or other UXO
 - 3.2.9. Improvised Explosive Devices (IED)
 - 3.2.10. The threat by CBRN agents and natural and industrial danger potentials
- 3.3. The Threat to Fixed or Semi-permanent Logistic Installations
- 3.4. The Threat to Mobile Logistic Forces

4. LOGISTIC FORCES' FORCE PROTECTION MEASURES CURRENTLY AVAILABLE

5. FORCE PROTECTION REQUIREMENTS IN FUTURE OPERATIONS

5.1. General Capabilities

- 5.1.1. Command and Control
- 5.1.2. Training
- 5.1.3. Protection against CBRN Threats

5.2. Requirements to Protect Fixed Logistic Installations

- 5.2.1. Protection against Small Arms and Hand-Held Antitank Weapons
- 5.2.2. Protection against Effects in the Electromagnetic Spectrum and Against Hostile Intelligence and Reconnaissance
- 5.2.3. Protection against IED
- 5.2.4. Protection against High-Angle Fire (RAM)
- 5.2.5. Protection against Diseases and Animals

5.3. Requirements to Protect Mobile Logistic Forces

- 5.3.1. Protection against Climatic Conditions
- 5.3.2. Terrain and Infrastructure
- 5.3.3. Population
- 5.3.4. Protection against Effects in the Electromagnetic Spectrum and Hostile Reconnaissance
- 5.3.5. Protection against Small Arms Fire (SAF)
- 5.3.6. Protection against Mines and UXO
- 5.3.7. Protection against the IED Threat
- 5.3.8. Protection against RPG and ATGM
- 5.3.9. Protection from the Air Threat Including Unmanned Aerial Vehicles (UAV)

6. DESCRIPTION OF THE GAP

- 6.1. Command and Control
- 6.2. Intelligence and Reconnaissance
- 6.3. Mobility
- 6.4. Training
- 6.5. Equipment

7. RECOMMENDATIONS

7.1. Force Protection Capabilities of Logistic Forces

7.1.1. Command and Control

7.1.2. Mobility

7.1.3. Training

7.1.4. Equipment

7.2. Force Protection Capabilities to be provided by Combat and Combat Support Forces

BIBLIOGRAPHICAL DATA STUDY – G.26.R

<p>1. <u>References</u> :</p> <p>Minutes of the PME Meeting 1/2006. (FN/SEC/27.108-EMP dated 2 February 2006 Draft mission paper G.26.R.</p>	<p>2. <u>Other references</u> :</p> <p>C.16.R : MEDICAL SUPPORT. C.20.R : LOGISTIC SUPPORT ON A MULTINATIONAL FORMATION IN EUROPEAN THEATRE OF OPERATIONS C.33.R : DEFINITION OF THE AREAS OF LOGISTIC SUPPORT FOR MULTINATIONAL OVERSEAS OPERATIONS IN WHICH TASK SHARING OR HIGH SPECIALISATION IS POSSIBLE BETWEEN THE FINABEL COUNTRIES AND COULD BE SET BEFORE THE START OF AN OPERATION. C.37.R : CONTRACTOR SUPPORT TO MULTINATIONAL FORCES ON DEPLOYED OPERATIONS (Study currently drafted). G.27.R : FIELD CAMPS OF FORCES DEPLOYED ON OPERATIONS: HARMONIZATION OF SELECTION CRITERIA FOR SITES AND IMPROVEMENT OF THEIR PROTECTION. (Study currently drafted).</p>
<p>3. <u>Promulgation</u> : 29 November 2008</p>	<p>4. <u>Revisions</u> : N/A</p>
<p>5. <u>Number of Pages</u> : 40</p>	<p>6. <u>Classification</u> : UNCLASSIFIED</p>
<p>7. <u>Title</u> :</p> <p>LOGISTIC FORCE PROTECTION ON A MULTINATIONAL OPERATION; HOW TO INCREASE PROTECTION OF LOGISTIC CAPABILITIES OF FINABEL NATIONS DEPLOYED INDIVIDUALLY OR COLLECTIVELY ON OPERATIONS.</p>	
<p>8. <u>Originator</u> :</p> <p>Germany</p>	<p>9. <u>Address</u> :</p> <p>Oberstlt Max-Dieter Jahnke Heeresamt I 5 (2) Brühler Straße 300 50968 Köln Germany</p>

10. Keywords :

Threat, Force protection, Logistic Forces, Logistic Installations, Physical Protection, Hazard Management, Medical Service, Protection Capabilities, Training, Sustainability and Logistics, Lessons Learned/Lessons Identified.

11. Summary :

The study covers all activities of logistic forces of Finabel member nations during operations in a land-environment on tactical level including activities of the medical service.

The study describes the logistic forces engaged in future operations, their tasks and their capabilities. It defines the threat these forces are exposed to and analyses the force protection capabilities of logistic forces currently available. The study investigates the force protection requirements in future operations concerning personnel, equipment, stocks and operational procedures, analyses the gap between investigated requirements and capabilities currently available and closes with recommendations, how to close the gap.

12. Abstract :**1. Aim of the study**

The aim of the study is to investigate how Finabel nations can increase the protection of logistic capabilities (personnel, equipment, stocks, operational procedures, etc.) in order to conduct logistic support operations for a combat force. Opposing forces (DE) will try to limit our freedom of action. Diverting combat/combat support forces from their prime mission may afford the hostile elements (DE) some advantage. The study should make recommendations how to adjust tactics, techniques and procedures (TTP) that maximize the self-sufficiency of logistic forces in their own protection.

2. Main aspects

- Logistic and medical service capabilities in future operations
- Tasks of logistic forces and medical services in future operations
- Description and analysis of the threat logistic forces are exposed to
- Logistic forces' force protection measures currently available
- Force protection requirements for Logistic Forces in future operations
- Description of the capability gap
- Recommendations to improve protection capabilities of logistic forces

3. Main recommendations

In future operations logistic forces should be trained and equipped to be capable of providing an appropriate level of force protection. They should be able to defend themselves and survive in a hostile environment including :

- repel attacks against their facilities by light hostile forces equipped with infantry weapons,
- protect themselves during movements against light infantry forces as well as against attacking criminal gangs and assert themselves against a hostile and potentially violent population.
- protect themselves against CBRN attacks and Remote controlled Improvised Explosive Devices (RCIED)

Tailoring own forces to mission during planning process in preparation of future operations, additional capabilities to provide force protection measures not only but also for logistic forces have to be taken into account.

Additional support by combat and combat support forces to provide force protection measures is essential concerning

- Protection against prepared attacks of symmetrically fighting forces or special forces especially in high-intensity operations,
- Protection against high-angle fire (RAM),
- Protection against the air threat including unmanned aerial vehicles (UAV),
- Protection against mine/ IED threat,
- Infrastructure engineering.

Detailed Information can be found in paragraph 7 of the study

1. INTRODUCTION

1.1. Aim and Purpose

The aim of the study is to investigate how Finabel nations can increase the protection of logistic capabilities (personnel, equipment, stocks, operational procedures, etc.) in order to conduct logistic support operations for a combat force. Opposing forces will try to limit our freedom of action. Diverting combat/combat support forces from their prime mission may afford the hostile elements some advantage. The study should make recommendations how to adjust tactics, techniques and procedures (TTP) to maximize the self-sufficiency of logistic forces in their own protection.

The study

- should encompass all possible operations to which any Finabel nation may make a contribution ;
- must not assume that the tactical commander will automatically divert combat or other forces from their primary mission to assist with logistic force protection, though this does remain one of his options ;
- has to identify other possibilities from the whole spectrum of TTP (e.g.: developing or modifying existing equipment as well as procedure) to give flexibility to the JFC in this particular task.

Recommendations within the study are advisory only and nations will decide whether and to which extend to adjust their TTP, reallocate equipment, adjust training etc.

1.2. Areas covered

The study covers all activities of logistic forces of Finabel member states during operations in a land-environment on tactical level including activities of the medical service (though in some Finabel member nations Medical Service is not a responsibility of logistic forces).

The study describes the logistic forces engaged in future operations¹, their tasks and their capabilities. It defines the threat these forces are exposed to and analyses the force protection capabilities of logistic forces currently available. The study investigates the force protection requirements in future operations concerning personnel, equipment, stocks and operational procedures, analyses the gap between investigated requirements and capabilities currently available and closes with recommendations, how to close the gap.

¹ All kind of future operations to which any FINABEL nation may make a contribution

1.3. Limitations

The study is focused on logistic support to land operations on tactical level. Strategic and operational deployment of forces and materiel are not covered, though the recommendations of the study are also applicable to these operations.

Fieldcamp construction and maintenance are identified as special logistic tasks for logistic forces of some Finabel member states. The requirements concerning the protection of field camps are excluded in this study, because this item is covered by study G.27.R.

To provide logistic support by contractors will not be taken into account, because this item is covered by study C.37.R.

Convoy operations in the contemporary operating environment should be considered as operations in their own right.

They

- must be correctly planned and resourced just like any other operation in war ;
- are in general executed by combat forces supported by combat support forces and
- require a broad spectrum of force protection measures.

Though logistic forces are often part of a convoy the special requirements for convoy protection are not a subject of this study.

1.4. Period of Validity

The study will have a validity period of 10 years after its promulgation. If there will be a significant change within in the operational environment in an earlier stage, the study will be adapted to the new requirements.

Within a near-mid term timeframe validity should be harmonised to be consistent with NATO doctrine on “Operational Logistics Chain Management” (OLCM) currently under development.

1.5. Reference Documents

1.5.1. NATO Documents/Allied Papers

The following NATO Documents and Allied papers were taken into account :

- AJP-3.13 “ ALLIED JOINT DOCTRINE FOR THE DEPLOYMENTS OF FORCES” (RATIFICATION DRAFT1)
- AJP-3.14 “FORCE PROTECTION” (RATIFICATION DRAFT 1)
- ALP-4.2 LAND FORCES LOGISTIC DOCTRINE
- AJP-4(A) ALLIED JOINT DOCTRINE FOR LOGISTICS
- AJP-4.5: HOST NATION SUPPORT.

- AJP-4.6 MULTINATIONAL JOINT LOGISTIC CENTER DOCTRINE.
- AJP-4.9 MODES OF MULTINATIONAL LOGISTIC SUPPORT.
- AJP- 4.10 (A) “ALLIED JOINT MEDICAL SUPPORT DOCTRINE”

1.5.2. Finabel Documents

The following Finabel Documents were taken into account :

- C.16.R : MEDICAL SUPPORT.
- C.20.R : LOGISTIC SUPPORT ON A MULTINATIONAL FORMATION IN EUROPEAN THEATRE OF OPERATIONS
- C.33.R : DEFINITION OF THE AREAS OF LOGISTIC SUPPORT FOR MULTINATIONAL OVERSEAS OPERATIONS IN WHICH TASK SHARING OR HIGH SPECIALISATION IS POSSIBLE BETWEEN THE FINABEL COUNTRIES AND COULD BE SET BEFORE THE START OF AN OPERATION.
- C.37.R : CONTRACTOR SUPPORT TO MULTINATIONAL FORCES ON DEPLOYED OPERATIONS (Study currently drafted).
- G.27.R : FIELD CAMPS OF FORCES DEPLOYED ON OPERATIONS: HARMONIZATION OF SELECTION CRITERIA FOR SITES AND IMPROVEMENT OF THEIR PROTECTION. (Study currently drafted).

1.6. Definitions

The essential terms in context with the study are defined as follows :

Force Protection (FP) Force Protection is defined as measures and means to minimise the vulnerability of personnel, facilities, materiel, operations and activities from threat and hazards in order to preserve freedom of action and the operational effectiveness there by contributing to mission success (AJP-3.14 Ratification Draft)

Threat and Risk. ‘Threat’ is defined as the possibility of an undesirable event taking place. In the context of military operations it is the possibility of an event which may adversely affect Combat Fighting Power (CFP) or compromise the mission. Threat is the product of capability and intent on the part of an adversary. Both constituent parts must be present for a credible threat to exist. A threat assessment in relation to adversary threat is produced by the J2 staff. The inherent threat from environmental dangers or from our own or allied weapons and systems exists without there being an intent. ‘Risk’ however takes into account both the likelihood of the event and the significance of the consequences, i.e. the impact it will have on a force’s assets or its ability to prosecute its mission. Therefore risk can only be determined with J3 (Ops) input.

Logistics. 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 :

- Acquisition, storage, transport, distribution, maintenance, evacuation and disposition of materiel;
- Transport of personnel;
- Acquisition, construction, maintenance, operation and disposition of facilities;
- acquisition or furnishing of services; and
- Medical and health service support. (AAP-6 & MC 319/1)

Maintenance.

- All actions taken to retain equipment in or to restore it to a specified condition, including inspection, testing, servicing, classification as to serviceability, repair, rebuilding and reclamation.
- All supply and repair action taken to keep a force in condition to carry out its mission.
- The routine recurring work required to keep a facility (plant, building, structure, ground facility, utility system, or other real property) in such condition that it may be continuously utilised, at its original or designed capacity and efficiency, for its intended purpose.(AAP-6) (not covered by logistic forces).

Medical and Health Support. The mission of medical support in military operations is to support the mission, through conservation of manpower, preservation of life and minimization of residual physical and mental disabilities. Appropriate medical support makes a major contribution to both force protection and morale by the prevention of disease, rapid evacuation and treatment of the sick, wounded and injured and the return to duty of as many individuals as possible (AJP-4.10 (A) Para 1016).

2. LOGISTIC AND MEDICAL SERVICE CAPABILITIES IN FUTURE OPERATIONS

The battle space is no longer linear, therefore all forces, including all elements of logistic forces will be engaged in future operations. The logistic support is tailored to the mission, and so are the logistic forces. In the future, logistic assets/capabilities will be tailored to fully support, from a technological perspective, the deployment of Combat and Combat Support Forces. The re-organisation of the Capability Basket will play an important role in a reception staging onward movement (RSOM) operation and the implementation of the logistic projects linked to the Battlefield Digitisation.

To support a multinational operation Finabel member states will provide different types of units/bn with different equipment.

Organic logistic forces responsible for battlefield damage repair (BDR), recovery, supply and medical service will be integrated at company or battalion level as an integral part of combat/ combat support units. These logistic elements build up an logistic area close to the units which is normally high mobile and able to follow the supported elements.

At regiment/brigade-level logistic is integrated in logistic unit size. On Division level (Response forces) there is a Logistic Battalion that may be reinforced by joint logistic forces.

Beyond Brigade level forces will be supported by joint logistic forces, including medical facilities (air, land, maritime) and maintenance capabilities supporting deployment, RSOM and redeployment. These logistic forces are not tackled in this study.

On Brigade level and above part of the logistic elements are semi-permanent and others are mobile. Mobility of logistic forces depends on the type of operation and the task the units have to fulfil (transportation, mobile maintenance teams etc.).

The capabilities of logistic forces and of the medical service in future operations are described as follows.

2.1. Logistic Forces and Capabilities in Future Operations

In high intensity operations many Bn/ Coy AOR of logistic forces are widely dispersed in the area of operation.

On 1st line logistic level the log elements build up a logistic area inside a coy/bn AOR which is normally high mobile and able to follow the supported elements.

On the 2nd line logistic level the elements will establish their own AOR and are partly stationary and partly mobile. These depend on the type of operation and the task the units have to fulfil.

To ensure the maximum use of their capabilities the units (company-size) are deployed in AOR of 1-15 km².

In stabilisation operations logistic and medical installations will be deployed as part of a semi-permanent installation inside a field camp or military headquarter. The needed space for conducting the logistic assistance depends on various parameters (e.g. size of force, ammunition safety regulations etc.). But for protection reasons they could be part of the whole installation/ field camp that has to be protected.

In future operations logistic forces will be tailored to mission and provide logistic capabilities by several different units. Regardless the national definition of logistic tasks and how they are defined in Study C.33.R, Annex 3, logistic forces have to provide all capabilities/resources as described in MC 319/2. These are

- units,
- personnel,
- equipment,
- stocks,
- financial resources,
- logistic information and
- other capabilities to deploy, sustain and redeploy forces over time.

In addition to the mentioned definition, Finabel member nations have to keep in mind the following details when providing logistic capabilities :

- Provision of focused and small trace logistics ;
- Deployment of replenishment methods and evacuation using standardized packages that can be transferred with the appropriate means of transportation either by land, air or sea ;
- In general the use of standardized materiel should be achieved ;
- Packaging of ammunition and wide use of chests ;
- Anticipation of express, exact and effective methods of diagnosis on the spot restoration of technical material ;
- Ensuring high level of medical treatment and maintenance procedures using methods such as tele-medicine and tele-maintenance ;
- Wide use of technology especially data based communication systems ;
- Organization of forward support units that if required directly supply combat units with all the critical and necessary material during the conduction of operations.

2.2. Medical Service Capabilities in Future Operations

Medical support is a responsibility of the Medical Services.

Medical Treatment Facilities (MTF) should, where appropriate, be as mobile and robust as the units they need to support, within the time related constraints of medical care and the provision of medical evacuation assets. An integral part of the definitions of capabilities is the determination of its output. A medically qualified doctor will provide supervised care at every Role.

In general medical capabilities are delivered by facilities at one of four medical role levels :

Role 1 MTF

The Role 1 MTF provides primary health care, specialized first aid, triage, resuscitation and stabilization. Generally Role 1 medical support is ultimately a national responsibility and it must be readily and easily available to all force personnel.

Included within the basic Role 1 capabilities are: basic occupational and preventative medical advice to the chain of command, routine sick call and the management of minor sick and injured personnel for immediate return to duty, as well as casualty collection from the point of wounding and preparation of casualties for evacuation to the higher level MTF.

Whenever a national contingent is unable to meet these criteria an increase in capability or medical support from another contingent's medical resources should be negotiated.

In accordance with the mission, Role 1 medical capabilities may include the following :

- Minimal patient holding capacity.
- Primary dental care.
- Basic laboratory testing.
- Initial stress management.

Role 2 MTF

Role 2 is defined as (Ref. MC 326/2): “A Role 2 MTF is a structure capable of the reception and triage of casualties, as well as being able to perform resuscitation and treatment of shock to a higher level than Role 1. It will routinely include DCS (Damage Control Surgery) and may include a limited holding facility for the short term holding of casualties until they can be returned to duty or evacuated”. It may be enhanced to provide basic secondary care including primary surgery, ICU (Intensive Care Unit) and nursed beds. The deployment of Role 2 MTF is mission-dependent, especially when :

- There are large numbers of personnel or a risk of high numbers of casualties.
- Geographic, topographic, climatic or operational factors may limit medical evacuation capability to Role 3 to comply with treatment timelines, especially when lines of communication are extended.
- The size and/or distribution of the force does not warrant the deployment of a full Role 3 capability. It is in light of this mission dependency and the need to ensure quality of outcome in the most efficient and effective manner that NATO countries felt the need to increase the clinical capability of their Role 2 MTF. Therefore Role 2 MTF are now classified into Role 2 Light Manoeuvre and Role 2 Enhanced.

Role 2 Light Manoeuvre (2LM)

Role 2LM MTF are light, highly mobile MTF to support component formations (normally brigade equivalent level). Normally these are only used for initial crisis or warfighting deployments. These MTF act as a focal point for Role 1 MTF in the formation, but may be bypassed if situation and resources allow. A Role 2LM MTF is able to conduct triage and advanced resuscitation procedures up to DCS. It will usually evacuate its post surgical cases to Role 3 (or Role 2E) for stabilisation and possible primary surgery before evacuation to Role 4.

In addition to Role 1, Role 2LM will include :

- Specialist medical officer led resuscitation with the elements required to support it.
- Routinely DCS with post-operative care.
- Field Laboratory capability.
- Basic imaging capability.
- Reception, regulation and evacuation of patients.
- Limited holding capacity.

Role 2 Enhanced (2E)

Role 2 Enhanced (2E) MTF are effectively small field hospital. They provide basic secondary health care, built around primary surgery, ICU and nursed beds. A Role 2E MTF is able to stabilise post-surgical cases for evacuation to Role 4 without needing to put them through a Role 3 MTF first. They have two principle uses :

- As a light mobile manoeuvre hospital in advance of Role 3.
- As a theatre or regional secondary health care hub mainly on stable operations where full capability Role 3 units are not justified. A Role 2E will normally replace both Role 2LM and full Role 3 units as an operation stabilizes.

In addition to Role 2LM, Role 2E will include :

- Primary surgery.
- Surgical and medical intensive care capability.
- Nursed beds.
- Enhanced field laboratory including blood provision.
- Casualty decontamination facilities for Chemical Warfare (CW) and Biological Warfare (BW) casualties dependent on the operational risk assessment.

Role 2 may have additional capabilities such as :

- Preventive medicine and environmental health capability.
- Primary dental care.
- Operational stress management, psychiatry or psychology.
- Tele-medicine capability.
- Patient evacuation coordination capability.

Role 3 MTF

Role 3 MTF are designed to provide theatre secondary health care within the restrictions of the Theatre Holding Policy. Role 3 medical support is deployed hospitalization and the elements required to support it. It basically includes surgical at primary surgery level, ICU, nursed beds and diagnostic support. Depending on mission characteristics it includes a mission-tailored variety of clinical specialties, focussed on the provision of emergency medical care. This does not exclude nations to include other specialties as well.

In addition to beds, including surgical and medical intensive care capabilities, required for the seriously ill and injured, the holding capacity will be sufficient to allow diagnosis, treatment and holding of those patients who can receive adequate treatment and be returned to duty within the Joint Operations Area (JOA), dependent on the Theatre Holding Policy. Resupply of Role 2 facilities and either control of, or ready access to, patient evacuation assets are included within the minimum capability. It is important to note that the mobility of Role 3 facilities depends significantly on the operational scenario. Many need only to be deployable in order to be deployed into theatre and will not require subsequent redeployment. However, in a highly mobile conflict some will also require to be redeployable in order to be able to continue supporting the manoeuvring formations.

Role 3 MTF can include mission tailored clinical specialties, of which the addition dependant on the need for medical/clinical assets to ensure emergency medical care, limit the repatriation of patients to Role 4 within the theatre holding policy and ensure adequate survivability during transport from Role 3 to 4. They can include

- Specialist surgery (neuro-surgery, maxillo-facial, burns, etc).
- Advanced and specialist diagnostic capabilities to support clinical specialists (CT scan, arthroscopy, sophisticated lab tests, etc).
- Major medical, nursing specialties (Internal medicine, neurology, intensive care, ophthalmology).

Role 4 MTF

A Role 4 MTF provides the full spectrum of definitive medical care that cannot be deployed to theatre or is too time consuming to be conducted there.

Role 4 would normally include definitive care specialist surgical and medical procedures, reconstructive surgery and rehabilitation.

This care is usually highly specialized, time consuming and normally provided in the casualty's country of origin or the home country of another allied nation. In many allied nations Role 4 care is provided for by military hospitals, but there are also models within the national (civilian) health care system. (AJP-4.10 (A) Para 1036-1054)

2.3. Tasks of Logistic Forces and Medical Services in Future Operations

Detailed tasks are the result of conducting the logistic capabilities co-operation between civilian and military organisations including network enabled capabilities based on the type and size of the operation. In general

- Transportation and movement
- Supply of all classes of materiel
- Maintenance
- Medical support

There is no significant change in logistic support through the spectrum of operations but in case of a major use of HNS and local contractors in NON-ARTICLE 5 operations.

In all operations the logistic forces have to conduct logistic transports (transportation of supplies) executed by single vehicles or in groups of up to 50 vehicles.

3. THE THREAT

3.1. General

Like any other operating force, logistic forces are threatened by potential attacks from midair, on the ground and/or from the seaside by

- equal, inferior or superior mainly militarily organised adversaries with comparable capability profiles, and/or by
- partly militarily organised adversaries who fight primarily with infantry means and attempt to compensate their "conventional" inferiority in strength, equipment and training by "unconventional" tactics and use of violence while frequently disregarding the principles of humanitarian international law, and/or by
- adversary forces and lone operators who apply tactics of armed raids, plots or robbery against friendly forces or their installations pursuant to the "rules" of organised crime in order to achieve their goals.

A conflict is called symmetric when the conflicting parties use similar assets and methods of action in order to achieve goals of a similar nature.

A asymmetric conflict is a type of conflict in which there is total disparity of scale and nature between the goals to be achieved, the means and the methods of action.

Any forces not part of the military such as guerrillas, terrorists, armed gangs, organised crime and - as a special case – covertly acting elements belonging to regular forces are called Irregular Forces. These represent a permanent global threat potential.²

² See Minutes PME Meeting 2/2004 Annex 8

Irregular forces are principally able to get access to any ordnance, ammunition, equipment and technologies available on the market. So they may optionally have the capabilities of :

- being effective against individuals, installation, objects and vehicles with precision and power, from any distance and under conditions of poor visibility,
- using armour-piercing and protector-penetrating projectiles from a certain distance,
- delivering long-range high-angle fires,
- being effective against airborne targets up to medium altitudes,
- occasionally employing either protected platforms for ground attacks from certain distances or flying platforms for reconnaissance, transport or especially for midair attacks against forces and installations,
- employing ordnance of most diverse designs, makeshift booby traps and other gadgets and explosive devices – also self-made (e.g. IED),
- producing or purchasing CBRN agents and/or hazardous substances, ordering their use and using them and/or releasing them by purposeful raids and
- using weapons, ammunition and explosives prohibited under the Geneva Convention and
- attacking the friendly IT system.

In a high-intensity conflict logistic forces and installations are threatened both by symmetrically and asymmetrically fighting adversaries while the threat in conflicts of medium or low intensity comes primarily from asymmetrically fighting and irregular forces who basically use means different to those employed by symmetrically equipped and organised forces. The intensity of the conflict therefore determines the main effort of the defence measures. Logistic forces must principally be able to defend themselves against the entire threat spectrum in any type of conflict.

3.2. The Threat Spectrum

In the analysis of the threat potential under the aspect of asymmetric threats special attention must be given to irregular forces, their options of using weapons, weapon systems, ordnance and employing subversive, criminal and terrorist means.

Commanders must determine the vulnerability of their forces/assets/facilities through a regular and comprehensive Vulnerability Assessment (VA) process. VA team composition, and the scope of the assessment, must be tailored to meet the unique requirements of the respective environment.

The basic threat spectrum for logistic forces and medical services on operations comprises as follows :

- Reconnaissance and espionage ;
- Disturbances caused by demonstrators, sabotage agents, foreign personnel ;
- Infantry weapons ;
- High-angle fires (e.g. rocket launchers, artillery pieces, mortars) ;
- Armed vehicles, armed vessels ;

- Manned aircraft³ ;
- Missiles and unmanned aerial vehicles⁴ ;
- Other flying objects⁵ ;
- MANPADS⁶ (with IR-technology and under command guidance) ;
- Unexploded explosive ordnance including mines and improvised explosive devices (IED) ;
- CBRN agents and hazardous substances and
- Electronic Combat measures and Computer Network Operations (CNO).
- Piracy and Banditry ;
- Kidnapping and Hijacking individuals⁷ ;
- Impact of Climate and Environment.

The threat spectrum is described in detail as follows.

3.2.1. The threat by infantry weapons

Infantry weapons hold a significant share in the threats to logistic forces and installations. These weapons are available on the commercial and on the black market. Regular and irregular forces are equipped with hand-held weapons of any type, the majority being automatic weapons such as assault rifles or submachine guns, hand grenades and shoulder-fired AT weapons.

Sniper weapons of any calibre will represent a permanent threat also to logistic forces and installations because the sniper is hardly to detect and exerts a strong psychological effect. The introduction of bigger calibre with HE-FRAG⁸-projectiles will in the future raise the quality of the threat to vehicles, objects and installations.

Aside from the heavy machine guns of calibre 12.7 mm x 99, 12.7 mm x 108 and 14.5 mm x 114 the combat support weapons also include automatic grenade launchers of calibre 30 mm and 40 mm. The latter are suitable to fight soft-skinned and light-armoured targets because of the grenades' high explosive power and fragmentation effect. The engagement of both point and area targets from a distance of up to 1700 m is realistic. Some grenade launcher ammunition of both common calibres has already been seized in the areas of operation. It must be expected that HE-FRAG and HEDP⁹ ammunition will be used against installations and objects as well as against office and residential buildings in the areas of operation. Also the use of thermo baric ammunition of these calibres cannot be excluded within the forthcoming ten years. A new quality of the threat also to logistic forces and installations would arise if in the next few years weapons with time-fused ammunition fell in the hands of irregular forces.

³ Any fixed and rotary wing aircraft operated by a crew

⁴ Unmanned, permanently or phase-wise driven ballistically and/or aerodynamically flying objects launched from ground-based, sea-based or airborne platforms and usable across a broad functional spectrum (e.g. UAV and CM).

⁵ Airdropped ammunition ((guided) glide bombs with increasing range and precision, vertical bombs), ballistic projectiles (unguided missiles) as well as all other airmobile or air-transportable platforms, objects or weapons (e.g. paragliders, parachutes, balloons, airships etc.).

⁶ MANPAD Man Portable Air Defence Systems

⁷ see AJP-3.14 Annex A page 4

⁸ HEFRAG High Explosive, Fragmentation

⁹ HEDP High Explosive Dual Purpose

3.2.2. Shoulder-fired anti-tank weapons

The shoulder-fired AT-weapons widely produced by different countries are offered in large numbers and at favourable prices on the weapon market. Low weight, portable by one individual, partially to be stripped (launching equipment, ammunition) or even expendable as well as a simple sight equipment make the shoulder-fired anti-tank weapon an effective weapon for terrorists. Also bunkers, ships and slow-flying aircraft (helicopters) represent suitable targets in particular during their approach, landing and take-off phases.

The shoulder-fired anti-tank weapon has become an accurate and long-ranging weapon (the new generation up to 4 km). The engagement range has increased to 1000 m. Modern electronics have improved the sighting equipment to a degree that was years ago to be found only on battle tanks. In the past years, the penetration power of the shoulder-fired anti-tank weapon was adapted to match the protection level of modern combat vehicles. The low procurement costs are an advantage for irregular forces that must not be underestimated.

3.2.3. Mortars

Mortars as a means to directly support dismounted forces with distributed fires against light-armoured and soft-skinned targets are of particular value. Their calibre range from 50 mm to 240 mm. Mortars will continue to be used worldwide over the next years because a considerable amount of their ammunition is still kept on stock. Modern armoured wheeled and tracked vehicles are used as weapon carriers.

Small-calibre mortars will come more and more in the focus of attention of irregular forces for their asymmetric warfare. Their small size makes these weapons hardly detectable when they are transported and operated. Their unique advantages include low weight and excellent mobility as well as their capability of being both covertly transported and rapidly positioned, especially in built-up areas and on difficult terrain.

3.2.4. Rocket artillery

Ballistic rockets of calibre 107 mm and 122 mm are widespread weapon systems. Their unconventional applications and the large number of fielded pieces make them an effective combat means for irregular forces. The rockets are easy to handle, have a low weight and are hardly to be detected during the launch phase.

Therefore also less trained personnel can effectively operate the rockets of calibre 107 mm. Their simple mounting on different carrier systems, their easy handling and the uncomplicated launching preparations make them particularly attractive for terrorists. From the hasty firing off a stone pile to applications as single or multiple rocket launchers everything is possible. When firing the rockets in a makeshift fashion, engagement ranges up to 8.000 m may be achieved.

The rockets of calibre 122 mm are nowadays fired from most diverse launcher systems including even DIY-welded launch frames. Single or double tube launchers operated by two men have also been recognised in the field. The variety of usable warheads is enormous. Engagement ranges of up to 20.000 m, with newer productions of more than 30.000 m are achieved by symmetric forces.

3.2.5. Tube artillery

Most different types of tube artillery pieces in various calibres are available worldwide. There is a difference made between field artillery pieces (unprotected, mostly vehicle-towed but also self-propelled pieces) and the armoured self-propelled artillery. The tube artillery forces are organized into firing units (batteries, battalions and above). Tube artillery ammunition is capable of destroying, smashing, dazzling or illuminating individuals, soft-skinned, lightly armoured and infrastructural targets. Here also engagement ranges of up to 20.000 m, with newer productions of more than 30.000 m are achieved.

Basically only regular forces may be expected to employ the complex tube artillery pieces owing to the relatively high manpower requirements. However, it cannot be excluded that also irregular forces may occasionally have some pieces ready.

3.2.6. Combat drones and UAV (model airplanes included)

Combat drones are unmanned and as far as possible stealth aerial vehicles capable of engaging pre-programmed even far remote single targets in defined target areas with highest accuracy. In addition, unarmed UAV are employed particularly for reconnaissance operations at any range. All modern armed forces have UAV of different range and size on stock.

In view of the asymmetric spectrum, also aerial vehicles designed for different usage must be considered. An adequate know-how provided, unmanned aerial vehicles that are freely available on the market and employed for building, farming or surveying purposes can be equipped with explosives and so converted into combat drones. Owing to their capabilities they represent an attractive combat means not only for financially weak countries but also for non-governmental actors, e.g. terror organisations. The technology is accessible without problems.

Model airplanes are excellently suited for the espionage and reconnaissance of target objects and for terrorist attacks because they are available worldwide, relatively easy to operate and capable of carrying additional payload. Provided an undisturbed line-of-sight, they can be remote-controlled by radio over several hundreds of meters. The hand-over to a second person with a second remote-control system next to the target location is possible. The threat potential basically depends on the feasible explosive payload and on the available remote control capability.

Commercial model airplanes with their take-off weight of some 25 kg may carry a maximum payload of 12 to 15 kg (e.g. ordnance, explosives or optical systems). This payload allows covering a broad operational spectrum. Irregular forces will probably prefer models with low-noise drives because the surprise factor plays a decisive role. The existing air defence systems provide only a limited degree of protection against this type of threat.

3.2.7. Man-portable air defence weapons (MANPAD)

Almost all armed military forces employ MANPAD (Man Portable Air Defence). Because they have a relatively low weight and can be disassembled and therefore easily transported, they are in general ideal for terrorist operations. MANPAD have primarily been designed to engage flying targets and reach here their highest efficiency. However, they may also be used against static logistic installations.

Before a MANPAD with IR-technology is fired, it must have already tracked a target. The more a target stands out from its environment, the better the search head can usually track the target. The infrared signature of the target and the spectrum in which the search head operates are decisive. Older systems like the SA-7 have shown how excellently they can track searchlights due to their integrated IR-technology so that they may generally be employed against illuminated installations on the ground.

With MANPADs that are operated under command guidance the operator aims at the target through an optical system and guides missile actively into that target. The operation of systems of this kind may be compared with guiding anti-tank missiles. The possible ranges are determined for all systems by the time the warhead is armed and the by (NL) maximum flight time (self-destruction).

In particular the older generation of MANPAD has so far been identified in the spheres of irregular forces. A further spread of systems of this kind among irregular forces must be assumed.

3.2.8. Mines or other UXO

Employed by both regular and irregular forces, a major threat is posed by mines which bring well-directed effects to bear against vehicles and/or personnel. Besides antitank mines and off-route mines, antipersonnel mines might be used as well. Mines can be laid individually or in clusters, surface-laid or buried, marked or not marked. If mines are used by irregular forces, it is assumed that the rules of international humanitarian law (including the Ottawa Agreement of 1987) are not complied with.

Moreover, individual mines or other UXO can be moved to roads as a result of weather effects (such as landslides or mudslides after heavy rainfalls) or placed on roadsides as “discovered ammunition” by the civilian population.

3.2.9. Improvised Explosive Devices (IED)

One of the biggest potential threat to military forces in all types of operation consists of attacks with makeshift explosive and incendiary gadgets / Improvised Explosive Devices (IED). Virtually every military operation is endangered by attacks with IED. In the context of the worldwide fight against terrorism a dramatically increased use of IED by irregular forces must be recognised. Logistic forces and installations are especially vulnerable to this threat owing to their mission.

Aside from the intended effect, the type of IED depends especially on the technical and tactical abilities of their designers, the available materiel and the conditions at the target location.

IED have developed into sophisticated weapons, which have proved to be unexpectedly challenging for conventional forces and current military technology to counter. Though they can vary widely in shape and form, IED usually share a common basic composition and consist of the following :

- an initiation system containing a switch ;
- explosive fill ;
- a detonator ;
- a power supply for the detonator, and
- a container or casing.

IED generate explosive pressure, fragments, projectiles, shaped charge effects, flames or any combination thereof¹⁰. They have often been assembled in an unusual manner, but they can also be technically complex what makes them hardly to detect, remove and/or clear or to jam by electronic countermeasures.

The tactics, techniques and procedures of adversaries using IED are constantly changing. They are conducting new attacks based on lessons learned. The most common attacks are, but not limited to, roadside ambushes, suicide bombing, convoy attacks, lure tactics, linked IED, and harbour attacks.

Quantity and composition of the used explosives determine the size of the effective area which in turn directly influences the way the IED is transported to, and emplaced at, the target (personnel, material, infrastructure). Known emplacement methods include, among others, depositing unsuspecting objects (suitcases, bags, rocks or concrete blocks), delivering letters or parcels, parking, or breaking through with, vehicles carrying large amounts of explosives¹¹, but also attaching explosives to military vehicles, ships or ramming ships with explosives-carrying boats on the high seas or from the seaside during the ships' lay days at the pier etc.

¹⁰ IED can also contain CBRN materiel.

¹¹ In the suicide attack of 07.06.2003 in KABUL, explosives to the amount of 50 kg were detonated which is comparatively small for a VBIED. In the VBIED attack on the HQ of the (US) Marines in BEIRUT on 23.10.1983 an explosive quantity of 5 tons was detonated.

Dangers arising from other hazardous substances (e.g. chemical, biological) contained in IED belong to the field of CBRN threats and are described below.

3.2.10. The threat by CBRN agents and natural and industrial danger potentials

The survivability of military forces both in operations and during routine duty receives a new dimension considering the threat of using, or the actual use of, chemical, biological, radiological and nuclear (CBRN) agents. Also in the future hazards through CBRN agents can not be excluded despite their use has been renounced or banned by several international agreements. For the time being, a massive attack with CBRN weapons is rather unlikely. The most likely scenarios describe covert operations at low level.

The danger has significantly increased that less predictable adversaries who are prepared to take high risks¹² are going to resolve conflicts both within and between countries by terrorist attacks – also with the aid of weapons of mass destruction. In addition, there are comparable threats arising in areas of operation from industrial CBRN danger potentials due to technical deficiencies or terrorist acts which might cause accidents or collateral damage in plants of the nuclear, pharmaceutical or chemical industry. The resulting dangers such as contaminations by chemical, biological or radiological substances to man and environment are threatening also locally operating logistic forces and installations.

3.3. The Threat to Fixed or Semi-permanent Logistic Installations

Fixed or semi-permanent logistic installations will be threatened by planned and prepared attacks of symmetrically fighting forces especially in high-intensity operations. Attacks by asymmetrically operating forces, however, must be expected across the whole mission spectrum.

Moreover, the threat to fixed or semi-permanent logistic installations depends on their location, e.g. built-up areas or open, flat or mountainous terrain.

The lessons learned from ongoing and recent operations determine the following prioritisation of threats :

- High-angle fires (RAM¹³).
- Direct fires (RPG¹⁴, ATGM¹⁵ und SAF¹⁶).
- Unmanned aerial vehicles (UAV¹⁷/UCAV¹⁸).
- Unexploded ordnance incl. IED.
- Chemical, biological and radiological agents or hazardous substances.

¹² STANAG 2451/AJP 3.8., Chapter 1, Nr.0105, Asymmetric means: „In the face of continuing NATO superiority in conventional military capabilities, adversaries may seek unconventional strategies and tactics, including the use of NBC agents and TIM, to reduce this advantage”

¹³ RAM= **R**ockets **A**rtillery **M**ortars

¹⁴ RPG = **R**ocket **P**ropelled **G**renade

¹⁵ ATGM = **A**nti **T**ank **G**uided **M**issile

¹⁶ SAF = **S**mall **A**rms **F**ire

¹⁷ UAV = **U**nmanne**A**erial **V**ehicle

¹⁸ UCAV = **U**nmanne**C**ombat **A**erial **V**ehicle

When dealing with threats to logistic infrastructure, consideration must be given to the possibilities of passing radioactive material into air conditioning systems of buildings to make them uninhabitable as well as of poisoning food or polluting water on premises with biological agents to cause epidemics involving many victims. Because of the expected considerable damage to environment and economy and the resulting uncertainty in the population CBRN terrorism must be assumed to be highly attractive as seen from a potential attacker. This makes the employment of such agents more likely.

A basic threat to soldiers within installations or objects arises also from contagious diseases that might be communicated from animals, human beings or food entering, or being already present in, the respective installation or object.

3.4. Threat to Mobile Logistic Forces

In high-intensity conflicts, mobile logistic forces are threatened by potential attacks of both symmetrically and asymmetrically operating forces. In operations of medium or low intensity, however, a threat by asymmetrically fighting forces seems to be more likely. The protection requirements of mobile logistic forces against asymmetrically fighting adversaries are considered to be the same at all intensity levels and therefore no longer subject to distinction.

The analysis of most recent military conflicts and of operations abroad as regards types and methods of attacks of asymmetrically operating forces has shown that not all threats take effect with the same frequency. In principle, protection from all types of asymmetrical threats must be called for. Should it, however, be impossible to meet all protection requirements concurrently, the measures against most frequent threats and threats involving the highest danger for friendly forces will be given adequate priority. The above-mentioned lessons learned determine the following prioritisation of threats :

- Unexploded ordnance incl. IED.
- Direct fires (RPG¹⁹, ATGM²⁰ und SAF²¹).
- High-angle fires (RAM²²).
- Unmanned aerial vehicles (UAV²³/UCAV²⁴).
- Chemical, biological and radiological agents or hazardous substances.

4. LOGISTIC FORCES' FORCE PROTECTION MEASURES CURRENTLY AVAILABLE

All logistic forces of Finabel member states are trained to handle the weapons they are equipped with and to have a basic self-defence capability. Prior to deployment, like all other forces they run through a special training to counter the threat as expected in the area of operation.

¹⁹ RPG = **R**ocket **P**ropelled **G**renade

²⁰ ATGM = **A**nti **T**ank **G**uided **M**issile

²¹ SAF = **S**mall **A**rms **F**ire

²² RAM= **R**ockets **A**rtilery **M**ortars

²³ UAV = **U**nmanned **A**erial **V**ehicle

²⁴ UCAV = **U**nmanned **C**ombat **A**erial **V**ehicle

Concerning command and control measures the equipment with appropriate communication and navigation systems is not the standard for every logistic vehicle. Even the commanding vehicles of the logistic forces are not always equipped with such systems. Nearly all Finabel member-nations have the provision with data-based information systems under development.

Logistic forces are equipped with light infantry weapons and shoulder-fired anti tank weapons. But only few vehicles of the logistic forces even on company or battalion level are equipped with such weapons and if so, only some of these weapons can be operated from inside the vehicle without abandoning the protection provided by the vehicles or are suited for day and night employment

Only few vehicles, logistic forces are equipped with, have a protection against the fire of light infantry weapon or against the threat caused by blast antitank-mines. Most of the vehicles in use by logistic forces have no protection or are provided with upgraded or improvised protection measures. Nevertheless the procurement of protected vehicles for logistic forces is planned in nearly all Finabel member states.

5. FORCE PROTECTION REQUIREMENTS IN FUTURE OPERATIONS

5.1. General Capabilities

The protection of logistic facilities and forces on operations is dependent on the threat and must always be regarded as an integral part of the overall operation. Protection must not start at the logistic facilities and installations. Instead, the latter must be integrated into protective measures as part of the overall operation so that military action in the environment of logistic forces and facilities always contributes either directly or indirectly to their protection. As a consequence, logistic forces must be operationally and technologically integrated into an overall protection concept.

5.1.1. Command and Control

Command and control of logistic forces in an operational theatre requires forces that are widely dispersed and/or allocated to different multinational formations to be kept informed and led in such a way that threats are identified early enough to initiate appropriate countermeasures.

This necessarily implies that all logistic forces are networked to generate a **Common Relevant Operational Picture (CROP). The primary objective must be to be provided with information about planned enemy activities in time to initiate counteraction.**

The logistic forces' ability to take part in Network Centric Warfare is particularly important. In this context, Network Centric Warfare is defined as the command and control and employment of logistic forces on the basis of a joint, cross-echelon and interoperable integrated information and communication system. Thanks to the integration into the data-based command and control network, the protection of logistic forces and facilities/installations can be considerably enhanced because the availability of data-based information systems largely allows for near real time information supply at and between all levels of command.

Logistic forces, too, must be able to benefit from the ability to reliably identify own/friendly, hostile and neutral platforms as well as from identification results which are provided as part of a common operational picture.

5.1.2. Training

Survivability on operations is mainly determined by the quality of preparation of operational forces, i.e. in particular the quality of their training.

Concerning protection capabilities, all soldiers serving in logistic units must be trained as they fight latest in the pre-deployment phase to ensure

- that they have good command of their weapons;
- that they have a basic self defence capability;
- that they are able to repel attacks against logistic facilities by light hostile forces equipped with infantry weapons and
- that they are able to defend themselves during movements against light infantry forces as well as against attacking criminal gangs.

The training should be mission oriented and should include threat assessment.

5.1.3. Protection against CBRN Threats

Given the wide dispersal of logistic forces in the area of operations, qualified NBC defence troops will only rarely be available to support logistic forces in countering a threat posed by nuclear, biological, and chemical agents. This is why logistic forces must be enabled to react, adopting NBC defence measures of varying degrees allowing for a modular augmentation from passively acting components to active countermeasures.

Logistic forces must have autonomous detectors for NBC agents and hazardous CBRN substances, which, being employed either in a stationary mode at the periphery of logistic facilities and installations or in a mobile mode during transports to automatically warn in case such substances draw near. As part of an extended capability, detection data must be analysed to initiate timely and appropriate NBC defence measures. Moreover, logistic forces must be able to carry out operational decontamination and rescue and recover contaminated personnel.

In some Finabel member states vehicles of logistic forces will be equipped with a CBRN environmental control system to prevent the breathing air of the crew and passengers from being contaminated from the outside.

5.2. Requirements to Protect Fixed Logistic Installations

With blockades, aggressive behaviour and well-aimed attacks, demonstrators, suicide bombers and asymmetric enemy groups can pose a local threat to logistic facilities/installations. This mainly applies to the access area, though the threat must never be considered to be limited to that area.

The protection of fixed or partly mobile (semi-permanent) facilities and installations requires capabilities allowing for both the direct protection of the facility and its personnel from external attacks and the protection of special logistic areas as well as of the personnel inside the facility.

Accordingly, the following capabilities are required for fixed and partly mobile (semi-permanent) logistic installations :

- reconnaissance/detection of individuals at close and very close range, reconnaissance/detection of vehicles and early checking of access authorisations ;
- installation/operation of stationary/mobile access/control facilities for personnel, material and vehicles ;
- installation/operation of stationary/mobile personnel and vehicle barriers ;
- installation/operation of stationary/mobile observation posts ;
- installation/operation of alert and security guard positions ;
- employment of automatic monitoring systems ;
- detection and identification of weapons, munitions, explosive ordnance, explosives and NBC agents (including hazardous CBRN substances), possibly at standoff range (e.g. by means of long-range detection devices) as well as integrated into the access and control facilities ;
- reduction of effects of direct and indirect fires on the facility/installation as well as of fragments and debris ;
- ability of logistic forces to employ both lethal and non-lethal weapon systems/delivery means.

5.2.1. Protection against Small Arms and Hand-Held Antitank Weapons

For the protection of facilities and installations there must be an integrated capability of countering ground threats from small arms and hand-held antitank weapons. This must be ensured by

- reconnoitring individuals equipped with small arms and hand-held antitank weapons,
- reconnoitring the use of small arms and hand-held antitank weapons,
- lethal and non-lethal engagement of individuals equipped with small arms and hand-held antitank weapons.

5.2.2. Protection against Effects in the Electromagnetic Spectrum and Against Hostile Intelligence and Reconnaissance

Facilities and installations are threatened by electronic attacks against their communication and IT systems as well as by sensors exploiting the electromagnetic spectrum, which the enemy uses for target reconnaissance and weapon guidance.

The following capabilities are required :

- protection of communication systems from jamming and deception by means of jamming-resistant transmission methods ;
- protection of IT systems from intrusion attempts by means of appropriate IT security measures ;
- implementation of cross system control functions in communication and IT systems, which detect and display jamming and intrusion attempts ;
- protection of communication systems from hostile reconnaissance by means of electronic protection systems ;
- reduction of particularly compromising signatures commensurate with the threat ;
- detection and qualified warning of the use of reconnaissance sensors in the electromagnetic spectrum (in particular electro-optical and radar systems) and of illumination by means of laser systems ;
- detection of the use of sensor-guided weapons by means of electronic support measures and their engagement by electronic countermeasures throughout the electromagnetic spectrum or by standoff countermeasures.

5.2.3. Protection against IED

To ensure the protection of facilities and installations against the effects of IED, IED must be detected, analysed and countered early and from standoff ranges. This also applies to sub-surface systems which are part of facilities/installations IED might be placed in. In particular, this might be the case in the access and entry area as well as in the access/control facilities for personnel, animals, material and vehicles.

In addition, there is a requirement for a means to inspect construction sites prior to the establishment of logistic facilities/installations for mines, explosive ordnance and IED and remove any ammunition found. This is a support by engineer or EOD forces.

5.2.4. Protection against High-Angle Fire (RAM²⁵)

The protection of facilities and installations against the RAM threat must be ensured without additional personnel by installing appropriate detection/warning systems and employing reconnaissance and delivery means as part of an integrated system. This is meant to allow for both early warning of friendly personnel from RAM attacks and prevention of hostile weapons effects.

Passive protection measures mainly include the hardening of vehicles and infrastructure through physical protection measures to reduce the atmospheric blast effects caused by the detonation as well as adequate individual protective equipment.

5.2.5. Protection against Diseases and Animals

To prevent diseases, the following aspects must always be considered when planning the establishment of facilities and installations :

- Medical Intelligence (MEDINT)²⁶: this may include :
 - * Assessments of environmental and health risks that forces may be exposed to.
 - * Development of medical threat analysis and its integration into the overall threat assessment.
 - * Requirement of information regarding the environment (e.g. specific climatic characteristics of the location) in which troops will be deployed, which could lead to adequate adaptive measures (such as air conditioning, heating, ventilation, humidification).
- Facilities and installations must be located, constructed and protected by disinfecting and disinfestation measures in such a way that
 - * animals which pose a direct or indirect threat to humans (wild animals, even domestic animals, snakes, scorpions, spiders, insects and other arthropods) have no access and are kept at bay,
 - * pathogen vectors are warded off effectively,
 - * regular medical controls allow for permanent awareness of the risk of infection by pathogens.

²⁵ RAM: Rockets, Artillery, Mortars

²⁶ MEDINT (Ref: AJP-4.10.3): Medical Intelligence is "intelligence derived from medical, bio-scientific, epidemiological, environmental and other information related to human or animal health. Note: this intelligence, being of a specific technical nature, requires medical expertise throughout its direction and processing within the intelligence cycle." It contributes to the determination of the medical capabilities and capacities and the planning of preventive medical actions by medical experts to prepare forces for pre-deployment, deployment and post-deployment. It supports the operational staff in planning measures to ensure the overall force health protection of deployed forces under their control.

5.3. Requirements to Protect Mobile Logistic Forces

Within the context of this study mobile logistic forces are forces that carry out transports for supply, repair or medical support purposes. For them, additional capabilities are required.

5.3.1. Protection against Climatic Conditions

Crews of logistic vehicles and their passengers must be able to travel even longer distances without feeling particularly fatigued or being forced to open windows and hatches. Primarily, this calls for air conditioned cabins in the vehicles used by logistic forces.

5.3.2. Terrain and Infrastructure

An effective, responsive, reliable and precise navigation capability is of basic importance for the employment of logistic forces.

The tactical mobility of all vehicles used by logistic forces is a major factor because it significantly enhances the protection of logistic forces in different ways.

- Threats during movements, in particular those posed by ambushes, snipers and IED, directly depend on the terrain through which the movement is to be conducted. The higher the tactical mobility of vehicles used by logistic forces, the more they will be able to evade threats by changing the route.
- Frequently changing routes between identical starting points and destinations will make it more difficult for enemy forces to plan attacks. On operations in theatres with poor infrastructure, this even necessitates the use of hardly trafficable routes, and, likewise, a high tactical mobility.
- An appropriate tactical mobility will also contribute to the ability to cross natural and artificial obstacles (barriers among others) without external assistance.

High tactical mobility as well as a high performance vehicle tracking and communication system will allow for rapid and responsive action, thus enabling flexible reactions to threatening situations.

5.3.3. Population

In an urban environment, in particular, logistic movements can be hampered, delayed or stopped by violent crowds, often in connection with barricades. Even sit-down demonstrations with demonstrators showing no aggressive behaviour can severely interfere with logistic movements.

As a result, the protection of logistic forces must be designed to remain effective even if they are confronted with a hostile, potentially violent population.

To be able to prevail and defend themselves against a potentially violent population, mobile logistic forces need a variety of lethal and non-lethal delivery means. All weapons and delivery means must be capable of being employed from inside the vehicles without abandoning the protection provided by the vehicles. The dismounted employment of all kinds of weapons and delivery means must also be possible.

All vehicle occupants must be protected against incendiary bombs.

The vehicles must be equipped so as to enable the crew to communicate with the population from inside the vehicle and under protection.

It must be possible to lock all doors centrally from inside and all containers mounted on the vehicle from the outside. Theft or damaging of externally mounted parts must not be possible. Cargo must be capable of being secured against theft.

5.3.4. Protection against Effects in the Electromagnetic Spectrum and Hostile Reconnaissance

Effective protection against hostile reconnaissance and effects in the electromagnetic spectrum requires the following basic capabilities :

- protection of friendly electromagnetic emissions by
 - * applying electronic protection measures,
 - * using modern transmission methods,
 - * avoiding compromising radiation (e.g. from private communication assets, emission security),
- hardening of electronic components of vehicle control systems against electromagnetic radiation,
- reduction of friendly signatures in the spectral ranges covered by hostile reconnaissance²⁷,
- automated, near real time and reliable warning of laser illumination,
- ability to prevent the initiation of hostile delivery means (RCIED etc.).

5.3.5. Protection against Small Arms Fire (SAF)

Mobile logistic forces are mainly threatened by raids, ambushes and attacks. Here, in general, hand-held infantry weapons including machine guns are used. The generic term for this threat is “Small Arms Fire.” A particular threat is posed by hostile snipers.

²⁷ such as sound, IR (characteristic radiation, reflection), visible light (reflection, contour), seismic activity (vibration).

To provide protection from small arms fire but also from other threats, e.g. mines and other UXO, logistic forces must be equipped with protected vehicles which meet the following requirements :

- maximum system-compatible ballistic protection (protection level 3 in accordance with STANAG 4569),
- maximum system-compatible mine protection (protection level 3a in accordance with STANAG 4569),
- all-round protection (front, side, rear) as well as protection against threats from elevated positions,
- weapon stations which
 - * are suited for day and night employment,
 - * are protected even against fires and fragments,
 - * can be operated completely under protection,
 - * allow for the engagement of enemy forces even in defilades or behind cover,
 - * allow for the use of lethal and non-lethal weapons while minimising collateral damage,
- cargo protection option, if applicable,
- camouflage painting impeding optical and electronic detection throughout the spectral ranges.

5.3.6. Protection against Mines and UXO

Besides the IED threat, mobile logistic forces are continuously threatened by mines and other UXO.

One of the most effective means to ensure the protection from mines and other explosive ordnance is to train logistic forces in an effective and situation-oriented manner so as to enable them

- to detect and localise explosive ordnance early,
- to initiate appropriate self-defence measures; this also includes the ability to leave mined terrain with all available assets,
- to mark and cordon off the location of UXO,
- and to provide a report to initiate the removal of the detected UXO by competent experts.

Besides the above-mentioned protected vehicles, the soldiers must have appropriate individual protective equipment for recovery and rescue missions.

5.3.7. Protection against the IED Threat

Mobile logistic forces are and will be threatened by IED. Logistic personnel have to be aware of this threat. Opposing military forces (OMF) will try to reduce freedom of movement (FOM) and cause as much victims and damage as possible. IED will also be emplaced at vulnerable points where logistic transports have to pass.

Logistic personnel must always be aware of vulnerable points. They must know about actual OMF tactics, techniques and procedures (TTP) and how to react against an IED attack. As far as the defence against IED and, in particular, remotely controlled IED is concerned, there is a requirement - as far as it is an all arms capability - for the ability to jam RCIED.

5.3.8. Protection against RPG²⁸ and ATGM²⁹

Besides the local threat posed by IED and mines, logistic forces conducting movements are confronted with an ever increasing threat posed by RPG and ATGM which are used by both irregular and regular forces. As part of passive protection measures, mobile logistic forces might use jammers, additional armour or/and smoke to protect themselves against RPG and ATGM.

Further and mainly active protection measures would overburden logistic forces and restrain them from performing their primary tasks. Accordingly, such measures have to be carried out by combat and combat support troops tasked with the protection of logistic assets.

5.3.9. Protection From the Air Threat Including Unmanned Aerial Vehicles (UAV)

On operations, mobile logistic forces are threatened by conventional aircraft such as helicopters and fixed wing aircraft as well as by other aerial vehicles. To counter this threat, Army Air Defence, Army Aviation or Air Force assets are required and must be tasked accordingly.

Not only because of their ever-increasing technical performance but also thanks to their reduced signatures and flight profiles as well as growing operational capabilities, Unmanned Aerial Vehicles (UAV) take on added importance. These systems will become the air asset of choice of „ordinary Joe“ in the near future. However, they will also be present in large quantities in the arsenals of technologically sophisticated countries throughout the world. They will pose a major threat in future operations.

Accordingly, the weapon stations integrated in the vehicles of mobile logistic forces should have an air defence capability, be capable of launching munitions suited to engage UAV and be equipped with an appropriate system.

²⁸ **Rocket Propelled Grenades**

²⁹ **Anti Tank Guided Missiles**

6. DESCRIPTION OF THE GAP

In most Finabel member states logistic forces are still equipped as required during the cold war phase, prepared to operate in middle Europe

Comparing the logistic capabilities currently available with the force protection requirements in future operations as described in chapter 5 force protection capability gaps are identified as follows.

6.1. Command and Control

Though it is essential for logistic forces to be able to initiate counteraction to enemy activity and to follow combat and combat support forces in a highly mobile operation most of the logistic forces have only scarce radio equipment at disposal. Even some logistic commanders are not equipped with an adequate communication system. Currently logistic forces have no cross-echelon and interoperable integrated information system, though in most Finabel member states such a system is under development.

This capability gap is the main reason that currently logistic forces are not able to have a Common Relevant Operational Picture (CROP) at disposal.

6.2. Intelligence and Reconnaissance

Logistic forces have only scarce reconnaissance capabilities within their structure. They are hardly able to prepare own movements and to reconnoitre follow on logistic installations. Concerning information about the ongoing operations and enemy activities they need the support of all arms intelligence and reconnaissance capabilities.

6.3. Mobility

Concerning tactical mobility, the vehicles, logistic forces are equipped with, have a cross country capability only on unit level. On brigade and division level most of the vehicles of logistic forces are dependent to use paved roads because they have limited off road capability.

6.4. Training

As stated in chapter 5.1.2, survivability on operations is mainly determined by the quality of preparation of operational forces, in particular by the quality of their training. To have good command of their weapons is an essential capability. In General the logistic forces of Finabel member states are trained as required.

The ability

- to repel attacks against logistic facilities by light hostile forces equipped with infantry weapons,
- to handle threat assessment and
- to defend themselves against light infantry forces as well as against attacking criminal gangs executing transports.

Might not be adequately trained on the same level by the logistic forces of all Finabel member states.

Regarding all arms counter mine, counter IED and all arms counter CBRN capability, training of logistic forces might not always be on the same level as it is required as an all arms capability.

6.5. Equipment

Logistic forces are equipped with light infantry weapons and shoulder-fired anti tank weapons. This kind of weapons is not adequate to assert against hostile population and violent crowds. There is a need of lethal and non-lethal weapons to be available for logistic forces also.

There also is a lack of protection against small arms fire as well as from other threats e.g. mines and other UXO, climatic or CBRN threats.

- Usually at present time logistic forces are not equipped with protected vehicles which meet the protection level 3 (STANAG 4569), this means the lack of a maximum system-compatible mine protection, an all-round protection (front, side, rear) as well as protection against threats from elevated positions,
- In general the vehicles do not have light infantry weapon stations which can be operated from inside the vehicle without abandoning the protection provided by the vehicles and which are suited for day and night employment,
- The doors cannot be locked centrally from inside, cargo is not secured against theft,
- Systems to prevent the activation of remotely controlled IED are not available as well as detectors for CBRN agents and hazardous CBRN substances.
- Only few vehicles are equipped with air conditioned cabins.

7. RECOMMENDATIONS

It is well understood, that it is a challenge for each Finabel member state to close the force protection capability gap as described above. To require force protection capabilities for logistic forces means, to take into account that logistic forces, which are occupied with force protection measures, are not available to execute logistic tasks. Diverting combat/combat support forces from their prime mission may afford the enemy some advantage. Therefore, to meet the threat against logistic forces in future operations, on one hand logistic forces must have minimum force protection capabilities at hand.

On the other hand there are force protection measures, in general those that require special skill, training or equipment that have to be provided by other forces and arms in theatre.

7.1. Force Protection Capabilities of Logistic Forces

In future operations logistic forces should be trained and equipped to be capable of providing an appropriate level of force protection. They should be able to defend themselves and survive in a hostile environment including :

- repel attacks against their facilities by light hostile forces equipped with infantry weapons,
- protect themselves during movements against light infantry forces as well as against attacking criminal gangs and
- assert themselves against a hostile and potentially violent population.
- protect themselves against CBRN attacks and Remote Controlled Improvised Explosive Devices (RCIED)

Therefore the following minimum force protection requirements for logistic forces concerning command and control, mobility, training and equipment are recommended.

7.1.1. Command and Control

The protection of logistic facilities and forces must be integrated into protective measures as part of the overall operation so that military action in the environment of logistic forces and facilities always contributes either directly or indirectly to their protection. As a consequence, logistic forces must be operationally and technologically integrated into an overall protection concept, the planning of main support routes and the movements of logistic forces included.

Logistic forces in an operational theatre are widely dispersed and/or allocated to different multinational formations. This necessarily implies that all logistic forces are networked to generate a **C**ommon **R**elevant **O**perational **P**icture (CROP). They must be kept informed and led in such a way that threats are identified early enough to initiate appropriate countermeasures, incl. force protection measures. Therefore to be provided with timely information about planned enemy activities must be the primary objective. This requires a joint, cross-echelon and interoperable integrated information and communication system for logistic forces.

An effective, responsive, reliable and precise navigation capability is of basic importance for the employment of logistic forces. A high performance vehicle tracking and communication system will allow for rapid and responsive action, thus enabling flexible reactions to threatening situations.

7.1.2. Mobility

The tactical mobility of all vehicles used by logistic forces is a capability required to be able to support combat forces and combat support forces executing the push-principle. In addition tactical mobility is a major factor to enhance protection of logistic forces significantly.

Threats during movements, in particular those posed by ambushes, snipers and IED, directly depend on the terrain through which the movement is to be conducted. The high tactical mobility of vehicles allows evading from threats by changing the route. Frequently changing routes between identical starting points and destinations will make it more difficult for enemy forces to plan attacks. Operations in theatre with poor infrastructure require the use of hardly trafficable routes and likewise a high tactical mobility. An appropriate tactical mobility will also contribute to the ability to cross natural and artificial obstacles (barriers among others) without external assistance.

That is why logistic forces not only on unit level but also on brigade and division level have to be equipped with vehicles having an unlimited cross country capability.

7.1.3. Training

Concerning protection capabilities, prior to deployment all soldiers serving in logistic units must be trained to have

- good command of their weapons and
- a basic self defence capability.

The training has to be mission-oriented and should include

- threat assessment,
- all arms counter mine/IED capability so as to enable them
 - * to reconnoitre and localise explosive ordnance early,
 - * to initiate appropriate self-defence measures; this also includes the ability to leave mined terrain with all available assets,
 - * to mark and cordon off the location of UXO, and
 - * to provide a report to initiate the removal of the detected UXO by competent experts.
- all arms counter CBRN threat capability so as to enable them
 - * to analyse detection data to initiate timely and appropriate CBRN defence measures,
 - * to carry out operational decontamination and rescue and
 - * to recover contaminated personnel.

7.1.4. Equipment

All logistic forces except medical service personnel should be equipped with light infantry weapons and shoulder-fired antitank weapons. To assert against hostile population and violent crowds they must have lethal and non-lethal weapons at hand.

To provide protection from small arms fire but also from other threats, e.g. mines and other UXO, logistic forces must be equipped with protected vehicles which meet the following requirements :

- maximum system-compatible ballistic protection (protection level 3 in accordance with STANAG 4569),
- maximum system-compatible mine protection (protection level 3a in accordance with STANAG 4569),
- all-round protection (front, side, rear) as well as protection against threats from elevated positions,

These vehicles should be equipped as follows :

- Light infantry weapon stations which can be operated from inside the vehicle without abandoning the protection provided by the vehicles and which are suited for day and night employment.
- To lock all doors centrally from inside and all containers mounted on the vehicle from the outside should be possible. Cargo must be capable of being secured against theft.
- Air conditioned cabins with a CBRN environmental control system should be available.
- Jammers to prevent the activation of RCIED should be available.

Logistic units should be equipped with autonomous detectors for CBRN agents and hazardous substances, being employed either in a stationary mode at the periphery of logistic facilities and installations or in a mobile mode during transports to automatically warn in case such substances draw near.

7.2. Force Protection Capabilities to be provided by Combat and Combat Support Forces

Tailoring own forces to mission during planning process in preparation of future operations, additional capabilities to provide force protection measures not only but also for logistic forces have to be taken into account.

Additional support by combat and combat support forces to provide force protection measures is essential concerning

- Protection against prepared attacks of symmetrically fighting forces or special forces especially in high-intensity operations,
- Protection against high-angle fire (RAM),
- Protection against the air threat including unmanned aerial vehicles (UAV),
- Protection against mine/IED threat,
- Infrastructure engineering.