BATTLE DAMAGE REPAIR ORGANIZATION UNDER COMBAT OPERATIONS

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Abstract: The paper presents a concept of a battle damage (expedient, temporary) repair organization under combat operation. The proposed concept was drawn up on the basis of allied and nation regulations and the study of battle damage repair systems which occur in the other NATO armies. When creating the mentioned concept there an assumption was made that battle damage repair system will be set in operation of current standard maintenance system.

Keywords: Logistics systems. Combat service support. Battlefield maintenance. Battle damage repair. Expedient (temporary) repair.

1 INTRODUCTION

Polish troops conduct operations overseas fulfilling their tasks within the zones deprived of combat means and along with high exploitation of military equipment in harsh field and climate conditions. Such situation causes damages, which do not take place in day-to-day peace-aimed usage at home. Along with intensive utilization effects and combat damages, also accident-related failures can sharply grow, which is usually brought about as a result of the terrain obstacles, limited visibility and great dynamics of operation. Therefore, countries, which forces have been taking part in various military conflicts or peacekeeping operations, are improving their systems of a battle damaged repair (BDR) of weapon systems directly in the combat area. The Polish Land Forces do not implemented such system yet except for a few tests conducted during military exercises. As a result, our troops are not prepared to properly execute this kind of repairs although we are required to be able to do so according to Stanag 2418.

2 CURRENT STATE OF AFFAIRS

According to the current logistics doctrine [6], battlefield maintenance at the brigade level is organized from full-time maintenance elements, that is maintenance company and additional strengthen elements from maintenance battalion of higher level. There are organized 1-2 mobile recovery – repair sections (GER), technical reconnaissance team (PRTech) and evacuation team (GET). The other forces are included into unit maintenance collection points (UMCP) - Fig. 1.

Fig. 1 Technical support system at the mechanized brigade level
Source: Authors’ study.
The reconnaissance - recovery team (PRiPT) is the first chain of battlefield maintenance that based on evacuation squad of fighting company. It is located at 500-700m from forward enemy battle area in case of conducting attack and 800-1200m in case of conducting defense. An operating time (available time) of PRiPT should be as short as possible not to let this team fall behind in relation to a supported company [9]. It is assumed that maximum operating time should not exceed 0,5 hours. The main tasks of this team are as follows:

- permanent observation of weapon systems of supported unit;
- rapid remove disabled, mired and abandoned equipment and returning it to operation;
- providing first aid to crews and operators;
- retrieves equipment for repair and return to the user;
- prevents enemy capture of equipment;
- maintaining permanent communication with recovery-repair section and reporting about technical situation and.

A mobile recovery-repair section (GER) is organized on the basis of a maintenance platoon of a logistics company of fighting battalion. The section can be strengthen with forces from a maintenance company of brigade. In case of attack the section is moving at the distance of 1,5-2km from fighting companies and in case of defense 3-4km form forward enemy battle area. An operating time (available time) of GER section should not be longer than 1-2 hours. The main tasks of this section are as follows [9]:

- location of the damaged equipment on the battlefield and assessment of a damage range and required recovery, repairs or evacuation;
- spare parts and technical materials supplying to the damaged weapon systems;
- providing first aid to crews and operators;
- technical support in water obstacles overcoming;
- exchange information about technical situation between reconnaissance-recovery teams and command post of battalion or brigade.

An evacuation team (GET) is an element that is created temporarily by means of forces and resources of maintenance company of brigade. It depends on type and intensity of combat operation. Main tasks of an evacuation team includes evacuation and movement of damaged weapon systems to designated areas, unit collection points or stationary workshops, as well as, retrieval of units and parts from broken equipment and evacuation of enemy equipment, which can be used to support own forces [8].

An unit maintenance collection point (UMCP) is a place where field repairs are executed. It is deployed by the main forces and means of maintenance company of logistics battalion and should be created with use of stationary technical infrastructure near logistics roads of evacuation. It is located at the distance of 8-10km from forward enemy battle area in case of attack and 12-15km in case of defense.

Prediction of weapon systems damage losses based on daily rates which are assumed on the basis of lessons and conclusions from contemporary wars and military conflicts as well as fire power of opponent’s weapon system is considered [3]. It is estimated in references that the daily losses of military equipment, depending on the type and pace of operation and many other factors, will vary from 10 to 40 % [3] [12] [15]. However, among the damaged weapon systems only a part of them will be irreparable. The rest will qualify to different levels of repair with regard to repair effort. Considering repair capabilities of current deploying mobile maintenance elements it is assumed that PRiPT will not be able to conduct any repair but only recovery tasks, GER will conduct 1. level repairs of low repair effort (2-4 hours) and maintenance companies that deploying UMCP will execute 1. level repairs of average repair effort (to 12 hours). The 2. levels repair will be executed only by maintenance battalions deployed at the division levels [3]. The conducted analysis proved that maintenance units and mobile support elements being deployed by them are neither prepared nor able to carry out expedient (improvised) repairs of weapon systems considering their special repair equipment, guidelines and instructions for operating in combat operations, as well as, trainings programs for logistics specialists [11] [14]. In terms of research mentioned in previous chapters, it was noticed that lack of such solutions in the current battlefield maintenance system significantly reduced its repair capacities and elasticity and; thus, it resulted in abilities to recover and restore combat power of fighting units. Additionally, there are numerous evidences that some of damaged equipment can be rapidly restored to the combat with a use of improvised methods [1] [4] [5], which will result in extending the fighting unit abilities to carry out operation and; therefore, lead to superiority over an opponent. The system of BDR is also indispensable in case of conducting operation in the long distance from their own logistics support and supply sources (peacekeeping operations and reconnaissance or sabotage operations, etc.) [10]. On the basis of the foregoing considerations, it has been decided to propose the concept in which the current maintenance system of land forces military units during tactical operations will be modified and
supplemented with BDR system. In this way the execution of improvised (temporary) repairs will be gained starting from a single military vehicle or other weapon system without losing opportunities to conduct standard recovery operations. The main principles and assumptions of proposed concept are as follows:

- The BDR system will be set in operation of current standard maintenance system and will operate on three levels, that is the 1. level of weapon system operator/crew (for example a tank or armored military vehicle), the 2. level of mobile recovery team (currently it is PRiPT or GER) and the 3. level of maintenance unit conducting repairs in a unit maintenance collection point (UMCP);
- Appropriately selected tools and repair materials will be applied at each level of the BDR system that provide maximum versatility of their use in relation to the possible extend of damage at the given level of repair;
- In addition to the general BDR doctrine at the level of land forces, which should be implemented primarily, specific instruction and procedures will be developed dedicated to specific weapon systems as well as instruction regarding the use of BDR kits on the various level of the system;
- A training system will be created, which allow to train soldiers in the rules of expedient (temporary) repairs and proper use of BDR tools and materials that will be used on their level. As a result, a course should be provided for all drivers and crews (1. level), recovery teams and mobile recovery – repair sections (2. level) and specialists of BDR squads of maintenance units (3. level);
- The BDR system will be flexible and modifiable in terms of taking into account changes in current tasks and equipment of troops as well as needs and comments from the system users.

3 A SYSTEM DIVISION ON THE TACTIC LEVELS

3.1 The 1. level of BDR system

The 1. level of BDR system – operator/crew of a weapon system occurs in most NATO armies. The idea of that level is to include a special set of repair tools and materials in the certain type of weapon system like armored vehicle, tank or self-propelled cannon. The dedicated BDR kit can be used by operator or crew to restore broken equipment to an operation with fast and expedient methods (Fig. 2). It is assumed that the direct user of a weapon system should be preferably skilled person with regard to its condition. The person is also closest to the failed system; therefore, he/she should take proper measures; first of all, to restore its technical efficiency. The conditions for the effective implementation of this level are: developing of BDR repair manuals for certain weapon systems, very good knowledge of construction and operation principles by operators/crews and their additional training concerning expedient (temporary) repairs with BDR kit, as well as, defining the operation procedures for operators/crews regarding opportunities and limitations of applying expedient (temporary) repairs in a particular military operation. The conducted exercises proved that a soldier, who knows his/her weapon system and can perform a standard repairs, is able to master BDR procedures and methods very quickly [7].

The 1. level BDR kit should fit in one bag or box and it should include tools and materials grouped by the purposes, such as: basic tools, regenerating taps, a repair kit for electrician and hydraulic installations, universal clamps, bands, pins and gaskets, composite adhesives of „rapid” group (curing time limited to 15 minutes) and chemical fluids for cleaning, sealing installations and loosening joints.

3.2 The 2. level of BDR system

The 2. level of BDR system has a different character in various armies of NATO [13]. In some countries it is based on a recovery vehicle which is equipped with special repair kits, in the others a dedicated vehicle is used as a t a carrier of BDR tools and materials (mobile workshop with BDR equipment). In the proposed concept, this level will involve the inclusion of properly prepared BDR kits to standard equipment of currently used reconnaissance - recovery teams (PRiPT) and mobile recovery – repair sections (GER). A PRiPT means combination of a trucked or wheeled recovery vehicle, as well as, a special equipment to conduct recovery tasks and BDR kit and well-trained crew. The mentioned team should operate at the company level and cooperate with operators/crews of a single weapon system and mobile elements of maintenance platoon of battalion logistic company (Fig. 3).

The main advantage of this approach is that the recovery team will be able to perform the entire spectrum of rescue tasks during combat operations in difficult to access terrain. The flow chart of recovery team operation is presented in Fig. 4.

The 2. level BDR kit should be placed in a few bags or boxes and it should include sets similar to 1. level kit tools and materials and additionally such sets and devices as: compressed air (e.g. lifting bags), welding and cutting (e.g. oxygen lance), auxiliary power generator, load safety equipment and composite adhesives of „rapid” and „elastomers” group (to repair rubber elements and insulation).
Fig. 2 The 1. level of BDR system
Source: Authors’ study.

Fig. 3 The 2. level of BDR system
Source: Authors’ study.

Fig. 4 Flow chart of reconnaissance-recovery team operation
Source: Authors’ study.
3.3 The 3. level of BDR system

The third and last level of BDR system will perform its tasks at the depot level of logistic support, which is a level of a maintenance unit conducting tasks in a UMCP. It could be both a level of maintenance company that is included in logistic battalion of fighting brigade, and maintenance battalion that is deploying its collection point in the back area of fighting division. The essence of that level would be maintenance unit complementing in a BDR squad or section and container workshop with proper repair sets starting from maintenance company (Fig. 5). The BDR kit of this level could be more complex than in the previous levels and it should also include composite adhesives of „super metals” group, which have better properties and longer curing time.

![Fig. 5 The 3. level of BDR system](image)

Source: Authors’ study.

The BDR section/squad would be the highest chain of BDR system and it should be deployed separately or in areas of unit collection points. Its main task would be professional verification of damaged weapon systems and their components in order to apply quick and improvised repairs. The mentioned repair would be conducted regarding standard repair is not possible due to lack of spares or too long time of its execution. This squad could act effectively during logistic support of peacekeeping operations. The U.S. troops experiences obtained during former operations have shown that many broken parts and components are unnecessarily sent to the country in order to carry out standard repairs although they could be effectively repair in the area of operation [2].

4 CONCLUSIONS

The presented in the article analyses enable to formulate the following conclusions:

- The Polish Armed Forces as a member of NATO should not only ratify but also implement standardization agreements in order to properly fulfill their tasks under any combat operations.
- The maintenance units and mobile support elements being deployed by them are neither prepared nor able to carry out expedient/battle damage repairs of weapon systems considering their special repair equipment, guidelines and instructions for operating in combat operations, as well as, trainings programs for logistics specialists.
- Current technical support system of the Polish Land Forces at the tactical level should be supplemented and reinforced by the properly designed and prepared elements of BDR system.
- The proposed concept of BDR organization should enable to; firstly, obtain the ability of executing expedient repairs from the lowest level, that is, from a driver or a crew of a weapon system vehicle; secondly, achieve synergy of actions resulting from supplementing the abilities of the current evacuation and repair potential of new; so far unemployed, technical and organizational solutions.
References


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