

A CONCEPTUAL FRAMEWORK FOR THE UTILIZATION PROCESS OF EXCESS AMMUNITION IN THE REPUBLIC OF BULGARIA

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Abstract: *The paper presents a conceptual framework for the utilization process of excess ammunition in the republic of bulgaria.*

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Introduction

The excess ammunition is a major problem for the logistics authorities. On the first place, their commercial realization imposes special requirements. Secondly, they require special storage conditions in order to prevent incidents related to their detonation or misappropriation by terrorist elements. Thirdly, the fact that most of them, have expired guarantees and are in poor technical condition makes them unsafe for storage. And fourthly, the large financial costs required for their storage.

In terms of the ongoing modernization of the army and the vision for the development of the Armed Forces of the Republic of Bulgaria in the horizon of 2035, it can be concluded that the amount of excess ammunition will continue to grow.

The main ways to dispose of excess ammunition are: commercialization and utilization of the same.

Commercialization is preferable, but its realization is difficult to achieve due to the deteriorating qualities of excess ammunition and reduced global interest in the existing nomenclatures in our country.

After analyzing the situation in a number of countries, it can be concluded that utilization is the main way to solve the problem of excess ammunition.

For successfully implementing the utilization process of excess ammunition in the Republic of Bulgaria, it is necessary to create a concept, which will be the basis for the development of a model for utilization.

The concept should provide for a comprehensive approach, the main activities of which should be in the following areas:

- changes in the legal (law) framework concerning the utilization process;
- providing funding;
- elimination of organizational and procedural weaknesses;
- construction (building) of utilization facilities.

1. Legal framework changes concerning the utilization process

One of the necessary changes in the legal framework concerning the utilization process in Bulgaria is related to the amendment of the law on state property so as to allow the free provision of contractors of by-products from the utilization of ammunition (gunpowder, explosives, packaging, ferrous and non-ferrous metals). Due to the physical and chemical changes in them, the gunpowder and explosives become dangerous. Thus, the problem with their storage in the warehouses of the Bulgarian Army will be eliminated. The problem of their commercialization or destruction will also disappear.

In addition, this can be used to reduce the cost of utilization once the value of the by-products is deducted from the total value of the order.

It is also necessary to change the legislation so as to allow the export of ammunition for utilization outside the borders of the Republic of Bulgaria.

The Law on Weapons, Ammunition, Explosives and Pyrotechnic Articles and the Regulations for its implementation in the Ministry of Interior also need to be amended and supplemented. The law needs to be revised, expanded and refined in section two "Scrapping and destruction of explosives, weapons, ammunition and pyrotechnic articles and utilization of weapons and ammunition" of Chapter Seven "Repair, scrapping, destruction and utilization", in which to formulate the parameters and requirements for the utilization process and the entities (individuals or legal entities) involved in it.

It is necessary to further develop and change Chapter Five "Decommissioning, scrapping, utilization and destruction of weapons, ammunition, explosives and pyrotechnic articles" of the "Ordinance on the terms and conditions for carrying out activities related to weapons, ammunition, explosives and pyrotechnic articles and their control in and from the Armed Forces of the Republic of Bulgaria". The aim is to optimize its adequacy and eliminate the admitted weaknesses and unclear points.

2. Securing funding

In order to solve the problems of financial nature of the utilization process, the following areas should be addressed:

A) Providing financial resources through:

- budget financing;
- outside budget funding;
- allocation of revenues from the commercial sale of excess ammunition for the realization of the utilization process;

B) Reduction of the utilization costs:

- providing the remaining raw materials after utilization to the contractors;
- utilization only of the ammunition without their packaging.

C) Commercial sale of the ammunition designated for utilization.

In order to secure the necessary funds from the budget of the Ministry of Defense, it is necessary to return project 10 "National Program for Utilization and Destruction of Excess Ammunition on the Territory of the Republic of Bulgaria" in the list of priority projects for modernization of the Bulgarian Army.

Extra-budgetary funding may be provided by a decree of the Council of Ministers of the Republic of Bulgaria or by international organizations and agencies of NATO, the UN (United Nations), the EU (European Union) or individual countries.

In addition to grants to provide financing, a loan could be taken on preferential terms, which would again be a good solution in terms of the high financial costs incurred for the storage of excess ammunition in the storage areas of military formations (according to published data, approximately 6.5 million leva per year are spent for the protection of 11 military storage areas).

Part of the necessary financial resources for the utilization can be provided by using the proceeds from the commercial sale of the excess ammunition for the utilization process.

After a change in the legislation, utilization costs can be reduced by up to 25% by providing the remaining raw materials after utilization to the contractors. In this way, additional financial resources

will be saved for the transportation and storage of the raw materials in the warehouses of the Ministry of Defense until their commercial sale or destruction.

On the other hand, utilization costs can be reduced if contractors only dispose of ammunition without their packaging. The packaging represents approximately 1/3 of the total mass, and for its utilization no special technologies and equipment are required, as in addition the process is not associated with risks for the life and health of the personnel performing the utilization. The packaging can be offered for commercial sale or destroyed by companies structured in the system of the Ministry of Defense (Terem Holding – EAD).

3. Elimination of procedural and organizational weaknesses

A) Reformulation of the lots

It is necessary to reformulate the existing lots of the ammunition, taking into account the following features:

- to be placed in one lot the ammunition with similar technologies for utilization;
- the lots should be balanced in terms of their tonnage and the time required for execution;
- in the lots the mass of the ammunition with and without packaging should be indicated.

B) Development of standard technical specifications for utilization of ammunition

It is advisable to develop standard technical specifications for ammunition utilization, which should include all nomenclatures of ammunition stored in the Bulgarian Army, without specifying their quantities.

The purpose of these standard specifications is to be shorten the time for the start of the procurement procedure for utilization.

In the presence of approved standard technical specifications, the procurement procedure could start immediately (if funds are available), and the specific nomenclatures and quantities of ammunition that will be offered for utilization can be indicated in an attached list to the request for delivery of a service that the applicant prepares.

C) Preparation of an unified directory of ammunition

In order to eliminate the problems related to the exact determination of the gross and net mass of the ammunition, it is necessary to make a reference for the tactical and technical characteristics of the same. For this you need of a directory, which must include the necessary characteristics of all ammunition located and in service in the Bulgarian Army (artillery, small arms, engineering, naval, aviation, etc.), tactical and technical characteristics of the individual elements of ammunition, as well as the masses of elements that are obtained after utilization, such as gunpowder, explosives, ferrous and non-ferrous metals (shell casings, cartridge casings, etc.).

The development of the directory will significantly support the activities of the experts who prepare the documents for the procedure for awarding the procurement procedure for utilization, as well as the activities of the commissions of the Ministry of Defense, which accept the raw materials, obtained after utilization and check their quantities.

D) Consistency in the supply of ammunition for utilization

The consistency of the supply of ammunition for utilization is of particular importance for the prevention of incidents related to the unauthorized detonation of the same in the processes of storage, transportation and utilization.

It is necessary on the first place to utilize ammunition that has been subjected to the longest storage, those stored in depressurized packaging or in open areas and those with very poor technical condition, and then the process to continue with those produced in later years and with better technical condition.

4. Construction of utilization facilities

The approaches for solving the problem with the utilization of ammunition, provided that there are no facilities for this, can be:

- construction of stationary utilization facilities;
- acquisition or construction of mobile utilization facilities.

A) Construction of an united stationary utilization center

The analysis of the experience of other countries shows that when constructing an united stationary utilization center, it must ensure the utilization of all types of ammunition, as well as to have a closed cycle of utilization, ie. not only performing the operations of securing and dismantling of ammunition, but also the processing of the materials obtained after the utilization. The center must have a suitable infrastructure, which includes: railway and road network, a sufficient number of secure storage facilities, administrative and communal buildings, specialized fire protection system, alarm and security system, etc.

The stationary utilization center has the following *advantages*:

- possibility for utilization of large quantities of ammunition;
- there are no restrictions in the type of ammunition for utilization;
- it has high productivity due to the ability to operate several production lines at the same time;
- high efficiency of technological processes;
- reduction of the risk of environmental pollution;
- possibility for modernization of the used equipment and change of the technological flows depending on the delivered ammunition for utilization;
- in addition there is an opportunity to use the stationary utilization center for the destruction of ammunition and their elements;
- possibility to use it for utilization and destruction of ammunition owned by NATO member countries or other countries in the region;
- possibility for construction of systems for utilization or processing of the residual materials from the ammunition after utilization;
- provides greater safety for personnel compared to transportable and mobile utilization systems.

Disadvantages:

- the need to provide large investments for the construction of permanent infrastructure;
- availability of costs for transportation of the ammunition from the storage base to the utilization site;
- possibility of accidents during the transportation of ammunition;
- the need to build facilities for storage of ammunition delivered for utilization and residual components obtained after utilization, as well as the construction of a security system.

B) Acquisition or construction of mobile or transportable utilization facilities

The mobile and transportable facilities for the utilization of ammunition first appeared in the early 21st century. They are systems for the utilization of ammunition in which the main components of the system can be quickly and relatively easily dismantled, moved and installed in a new place of work.

The main difference between "mobile" and "transportable" facilities, according to some experts, is the time required to install the facility. Accordingly: a mobile facility is defined as "a stand-alone facility on wheels or mounted on an ISO container and ready for operation within 1 ÷ 2 days", while a transportable facility is "a mobile facility that can be located on a vehicle and has a minimum preparation for entry into force 7 days'.

The main elements of both types of facilities are:

- elements for carrying out the transportation;
- elements for utilization;

- pollution control systems;
- autonomous power supply.

The main *advantages* of mobile and transportable utilization facilities are the following:

- lower economic cost, which is why not so much investment is needed as for the construction of permanent infrastructure;
- possibility for acquisition of the facility in a significantly shorter period of time than a stationary center;
- minimization of the costs for transportation of the ammunition from the storage place to the disposal site.
- elimination of the risks associated with the transportation of ammunition intended for utilization;
- need for a smaller deployment area;
- no specially equipped place for storage of ammunition and special protection of the same is required - for this the storage base in which the ammunition are located before the utilization and the existing security of the storage area are used;
- possibility to use the ammunition utilization system when conducting multinational exercises on the territory of the country.

Disadvantages:

- restrictions on the types and quantities of ammunition that the facility can utilize;



Figure 1: EOD Solutions Ltd Transportable Ammunition Destruction System (TRADS).

- lower productivity and respectively lower efficiency compared to the stationary utilization system;
- restrictions in the choice of technologies used for utilization;
- when moving and installing the system, time is lost, which could be used for utilization;
- modernization of the facility is not possible.

Application:

Mobile and transportable utilization facilities are applicable to smaller-caliber ammunition that can be utilized with simpler technologies, as well as the utilization of ammunition which is dangerous to transport or if the packaging is severely damaged.

An example of such a facility being put into operation is EOD Solutions Ltd Transportable Ammunition Destruction System. It includes a complete line for the utilization of small arms ammunition in one 40-foot ISO container or in two 20-foot containers equipped with a rotary kiln, generator, compressor, filtration system and lifting devices. The system has an approximate capacity of 700 kg of ammunition per hour, which is equivalent to 5.6 tons for an eight-hour shift in a continuous process. The facility has been tested in working conditions in Albania and Bosnia, and has been in use in Afghanistan since May 2012.

Conclusions:

1. The mobile and transportable utilization facilities have less financial value but cannot solve the problem, they can only to reduce the amount of excess ammunition until a stationary utilization center is built.

2. The guidelines provided for solving problems of a law and financial nature require the most time and effort, but they are essential for the properly performed and risk-free implementation of the utilization process.

3. The concept of utilization of excess ammunition for the armed forces requires the use a comprehensive approach and the simultaneous implementation of the planned measures to solve the problems and complete the process in a short time.

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