Chapter 19

Disposal and Destruction Processes of Ammunition, Missiles and Explosives, Which Constitute Danger When Storing

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Abstract. In order to reduce the risk associated with the storage of abundant quantities of ammunition, missiles and explosive materials, complete technologies of their disposal and destruction have been developed at SE “RIC “PCP”. These processes concern resource-recovery technologies which allow saving and returning various material resources, such as plastics, chemicals, etc., to the Ukrainian economy. NCTE, CTE, GME, HTP, RCEM processes implemented at the enterprise are characterized by more safety and minimum environmental discharge, hence they are an effective alternative to such destruction methods of ammunition, missiles and explosive materials as open burning (OB) and open detonation (OD).

Keywords. Destruction, ammunition, missiles, processes

Accumulation and long storage of ammunition, missiles and explosive materials (EM) in arsenals and military bases of Ministry of Defence (MOD) of Ukraine, which are no longer suitable for military use, is an urgent problem for Ukraine. At present according to specialists’ estimates more than 1 million tons of ammunition, missiles and EM are non-demanded by MOD of Ukraine or are excessive and constitute a risk of emergency situations to be followed by drastic consequences for neighboring populated areas and industrial centres, as well as they represent danger of environment pollution.

It should be noted that accumulation and storage of great quantities of ammunition, missiles and EM in bases and arsenals also constitute a risk of unauthorized theft and provoke terrorism.

Thereby at least 50,000 t of different types of ammunition, missiles and EM, which require immediate disposal or destruction, are annually assigned unserviceable for military purposes (see Figure 19.1).

For the purpose of removal of non-demanded and excess quantity of ammunition, missiles and EM from military bases and arsenals, the works on their disposal and destruction are performed in Ukraine in the framework of Government programs, and also with the participation of International organizations.
SE “RIC “Pavlograd Chemical Plant” (SE RIC PCP) is one of the leading enterprises in Ukraine, which carries out the works on disposal and destruction of ammunition and anti-personnel mines, missiles and propellant, as well as different explosive materials for military purposes. Technical, research and production capacity of the enterprise has allowed developing and introducing a number (several) of complex processes for destruction and disposal, practically, of the whole assortment of ammunition, missiles, solid propellant and explosive materials.

These processes concern resource-recovery technologies, which allow saving or returning different material resources such as metals, plastics, chemicals etc. to Ukraine economics. In addition these processes feature more safety and minimum environmental discharge and, accordingly, represent an effective alternative to destruction methods such as open burning (OB) and open detonation (OD) of ammunition, missiles and explosive materials. The enterprise’s production facilities, supplied with resource-recovery technologies and processes, allow disposal and destruction of at least 30,000 t of ammunition and missiles loaded with different types of explosives and propellants.

SE “RIC “PCP” has put into effect the following processes: noncontact thermal extraction of EM from ammunition (NCTE process); contact thermal extraction of EM from ammunition and their elements (CTE process); high-temperature processing of ammunition, their elements and EM (HTP process); hydromechanical extraction of EM from ammunition, missiles and their elements (GME process); manufacturing of industrial explosives with using reprocessi products of EM, extracted from ammunition and missiles (RCEM process). Figure 19.2 shows the processes diagram, where the reprocessing of EM extracted from ammunition and missiles into industrial explosives for mining industry and construction (RCEM), and reprocessing of metal scrap, plastics waste, soluble chemicals for recycling in civilian products (RCP) is final stage.

NCTE process, which is shown in Figure 19.3, allows destruction of ammunition and components of missiles, torpedoes, aircraft bombs, loaded with fusible explosive materials such as TNT or its mixtures with other explosive materials. Explosive materials being extracted are reprocessed into powdery or granulate industrial explosives with using of RCEM-1 process or into industrial detonator blocks (busters) for mining operations and construction with using RCEM-2 process.