STATE OF THE ART AND DEVELOPMENT PROSPECTS OF NON-LETHAL WEAPONS

(*Reference report*)

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The State Unitary Enterprise «Federal Research and Production Centre «Scientific Research Institute of Applied Chemistry» founded in 1945, is the leading pyrotechnic manufacturer in Russia.

Today the Institute is engaged in research, development and manufacture of pyrotechnic means in the field of arms, military equipment and special products in more than ten directions, including antiterrorist ammunition, non-lethal devices, self-defense weapon and security systems.

For the passed years the Institute has developed more than 500 special purpose items that entered service and lot production.

Throughout its history the enterprise has accumulated significant scientific and technical potential in the field of energy release control, changing output product parameters in a wide range combining different forms of physicochemical transformations, detonation, deflagratrion and combustion modes, volumetric reactions at various phases of fast-running processes.

More than 20 years ago the Institute, one of the first in Russia, developed antiterrorist devices that up till now are used by Special Forces units. They are «Zarya-2», «GSZ» and «Vzlet-M» (multielement) hand grenades, a «Plamya» stationary grenade and a MSK-40 multifunctional mine.

Nowadays the Institute is engaged in research and development of a new generation of antiterrorist and non-lethal weapon (NLW) based on the following main factors:

– light emission (pulse and continuous);

– sound emission (pulse and continuous);

– smoke (aerosol) generation;

– kinetic energy of scattering shock elements;

– combined effect of various factors.

Effects of one or several factors mentioned above and their application in various combinations depending on types of equipment, product power characteristics, configurations to provide both single and complex effects make the development basis for the whole class of non-lethal weapon of a new generation.

The Institute has recently developed multifunctional types of non-lethal weapon. They include:

– a complete set of hand grenades generating smoke, light, shock, and combined effects;

– a complete set of grenades for GP-25 and GP-30 types of under-barrel grenade launchers;

– a set of self-defense weapon producing traumatic and flash-and-bang effects;

– a set of multifunctional pyrotechnic means of a container type;

– security means of a modular type etc.;

– various types of non-lethal weapon for close-range fighting.

Fundamental studies in various areas of pyrotechnics provide scientific and technical base for the development of effective non-lethal products and security systems.

The basic principle of security system design including means for warning and attack is to decrease the role of personnel in territory and object protection.

Pyrotechnic warning devices are reasonable to use when the distance to the protected object is still large.

Pyrotechnic attack means able to temporarily incapacitate the intruder are mounted near and inside objects.

Besides the practical development of non-lethal systems the Institute of Applied Chemistry coordinates principles and conceptual approaches to production of this type of weapon and formation of long-term programs in this field.

Efforts undertaken recently by the Institute have resulted in the following:

– the non-lethal weapon definition is formulated;

– the non-lethal weapon classification is given;

– the tasks solved by NLW are outlined;

– the organizational questions of realization are defined;

– the basic prospects of NLW development are determined.

This period has ended in:

– development, coordination and approval of the concept of production and application of non-lethal weapon;

– formulation of the production program for non-lethal weapon for the period 2006–2015.

It is necessary to note, that the Institute of Applied Chemistry, alongside with other enterprises of the Russian military-industrial complex, features high scientific and technical potential in the field of defensive technologies that can be used for the development of non-lethal weapon, antiterrorist means and security systems.