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FEATURES OF THE ACTIVITIES OF SAPPERS DURING HUMANITARIAN DEMINING IN A RADIATION-CONTAMINATED AREA*Strelets Victor¹, Ph.D, prof., Stepanchuk Serhii¹, Strelets Volodymyr²**¹National University of Civil Protection of Ukraine, Kharkiv, Ukraine**²International humanitarian organization "The Halo Trust"*

At this time, more than 95% of the territory of the exclusion zone of the Chornobyl NPP, primarily in the forest area, is mined. Mines of the Zaporizhzhya NPP or the use of tactical nuclear weapons by the Russian occupiers are also not excluded. The report shows that an important and unsolved part of the problem of humanitarian demining is the lack of regularities in the operational activity of sappers of the State Emergency Service of Ukraine in conditions of radiation contamination.

Given the uniqueness of such a situation (it has never been seen anywhere in the world), as it is in Ukraine, when the sapper of the State Emergency Service of Ukraine must apply use as means of armor protection, as well as means of individual protection of respiratory organs and skin, experimental studies were carried out regarding the determination of humanitarian demining patterns in conditions of radiation pollution, depending on the protective equipment. As a control exercise was chosen «jerking of an explosive object». Its choice is explained by the fact that the practice of demining the area contaminated by explosive objects after its liberation from the Russian occupiers showed that even in peaceful territories they use the vile practice of double mining, when the main mine is additionally mined with a trap mine.

The working hypothesis is that obtaining patterns of execution of typical operations of humanitarian demining in conditions of radiation contamination by sappers of the State Emergency Service in the form of time distribution functions for their execution will allow their comparative quantitative analysis, taking into account the selected set of personal protective equipment. Implementation of the proposed method of comparative analysis of the patterns of execution of typical operations of humanitarian demining in conditions of radiation contamination by sappers of the State Emergency Service is carried out by comparing the time of implementation of the method of jerking of anti-tank mine. Anti-tank mine is at a distance of 50 meters from the shelter where the sapper is placed during the most dangerous stage. Three different options for using a complex of personal protective equipment are used under different conditions of possible radiation exposure: variant 1 – a combination of a protective suit L-1, armor protection of the type of protective body armor of the IV level of protection, a protective armor helmet of the level of protection III-A, and a respirator of the type ZM 6200 ffp3; variant 2 (photo 1) – a combination of L-1 protective suit, armor protection of the IV level of protection



type protective body armor, III-A level of protection armor helmet, and GP-5 type filter gas mask; variant 3 (photo 2) is a combination of L-1 protective suit, armor protection type IV protective vest, III-A protective helmet, and compressed air apparatus Dräger 7000.



Photo 1. – Combination of L-1 protective suit, armor protection of the IV level of protection type protective body armor, III-A level of protection armor helmet and GP-5 type filter gas mask



Photo 2. – Combination of L-1 protective suit, armor protection type IV protective vest, III-A protective helmet and compressed air apparatus Dräger 7000

It is shown (Fig. 1) that the results of the statistical evaluation of the obtained experimental results at the level of significance $\alpha=0.05$ are described by a normal distribution regardless of the combination of those means of individual respiratory protection in which they work.

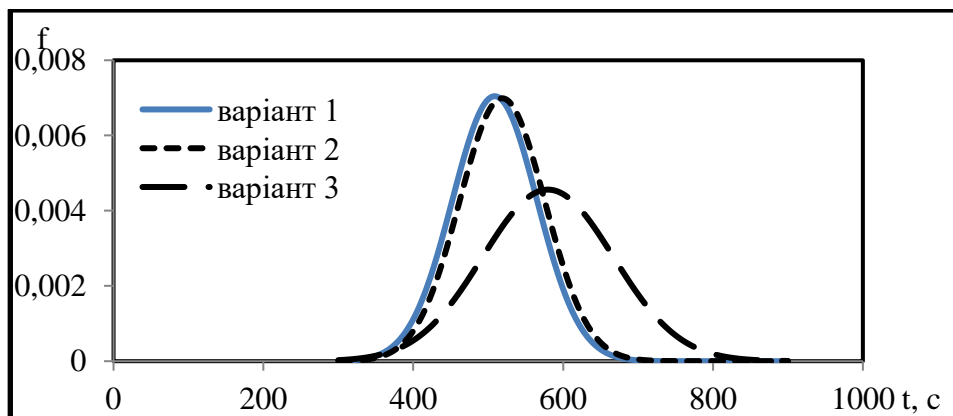


Figure 1. – Time distributions of the control exercise, which is typical for the process of humanitarian demining in conditions of radiation contamination, in different versions of protective equipment

A comparative analysis of the laws of humanitarian demining in conditions of radiation pollution, depending on the protective equipment of sappers of the State Emergency Service, showed that if the time of performing typical operations in a set of protective equipment, which includes a compressed air apparatus, differs significantly (with a significance level of $\alpha=0.05$) from their execution in a set that includes a filtering gas mask, the execution time in a set with an ffp3 class respirator is practically no different (at the level of significance $\alpha=0.05$) from the execution time in a set with a filtering gas mask.

