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INCREASING THE LEVEL OF PROTECTION OF CRITICAL FACILITIES OF THE ENERGY COMPLEX AGAINST HOSTILE ACTIONS FROM THE AIR DUE TO THE JOINT USE OF VARIOUS FORCES AND MEANS

Анотація: Важливість захисту об'єктів енергетичного характеру обумовлена важкими наслідками, які характеризуються руйнуваннями або знищенням інфраструктури та завданням значних економічних втрат.

Ключові слова: захист, критичний об'єкт, наслідки, засоби фізичного впливу, радіоелектронний вплив.

Abstract: The importance of protecting energy objects is due to serious consequences, which are characterized not only by the destruction or destruction of infrastructure, the task of significant economic losses.

Keywords: protection, critical object, consequences, means of physical influence, radio-electronic influence.

This paper examines the issue of the combined use of physical and radio-electronic influence during the protection of critical objects (CO), methods of determining the locations of physical influence means, which allows to evaluate the expected results of combined actions, as well as to develop scientifically based recommendations for their effective combined application as a part of special groups and develop proposals for their special actions in various conditions during the protection and preservation of cultural heritage, which is news.

The consequences of accidents at critical facilities of the energy complex are quite significant. It is because of this that it is necessary to pay more attention to the security of these objects, including their protection from aerial attacks. The experience of the leading countries of the world shows that the most effective protection of objects from air actions is a combination of efforts of special purpose means, for which it is advisable to consider some issues of compatibility of these means when protecting critical objects from actions or attacks from air. The study of these issues will allow to evaluate the expected results of joint actions, as well as to develop scientifically based recommendations for their effective application.

The consequences of accidents at important facilities are quite significant. This can be the destruction or destruction of infrastructure, the task of significant economic losses and, most importantly, it can lead to the loss of human life. The development of unmanned aircraft has opened up new opportunities for carrying out terrorist actions from the air against important objects.

Since October 10, 30% of Ukrainian power plants have been destroyed, which has led to massive power outages across the country. "There is no room left for negotiations with Putin's regime," Ukrainian President Volodymyr Zelenskyi said, calling the Russians' new tactics "terrorist."

On November 4, the Washington Post cited an estimate by Ukrainian officials that Russian strikes in recent weeks have destroyed approximately 40% of the country's vital energy infrastructure. The national power system was overloaded, and widespread rationing was introduced to prevent its power system from collapsing. According to the local authorities, on the night of November 3, Russian rockets caused additional damage, hitting energy and water infrastructure facilities in Kryvyi Rih.

When considering these issues, it is advisable to talk about the joint use of means of physical influence (fire means) and means of electromagnetic influence (means of radio-electronic warfare), while their joint use should be carried out taking into account the following approaches:

1. All flights of your aircraft over the object must be prohibited for the duration of measures to protect the CO.

2. Aircraft or their fragments, within the zone affected by fire means, must not fall on the territory of the CO. The modeling carried out in relation to the zone of debris fall made it possible to determine the dangerous distances of the location of the positions of fire equipment [1].

3. To deploy firearms, it is necessary to have previously equipped places along the entire zone (perimeter) that is intended for protection, or in the most threatening directions [1].

4. Before making a decision on the organization of the defense of a military base against actions or an attack from the air, it is necessary to assess the size of the object of protection and the area around it.

In each specific case, these factors must be taken into account when building a system of defense against air strikes.

5. The choice of locations on the terrain of firearms is a rather difficult task due to a significant number of conditions and restrictions.

In general, the scientific task of researching the combined actions of means of fire influence and radio-electronic warfare in the zone of defense of a military vehicle is multivariate. The number of options depends on the number and types of these tools.

The composition of means of fire influence and radio-electronic warfare and the order of their placement are mutually determined and closely interdependent. This relationship is caused, on the one hand, by those methodical approaches that exist to justify the optimal quantitative composition due to the necessary order of their placement, on the other hand, by the fact that any composition of means must be placed relative to the object of protection in a rational way. The effectiveness of joint actions depends both on the composition of the means and on the order of their placement, the parameters of which are the distance of the places of placement of means of fire influence and radio-electronic warfare from the boundaries of the object and the mutual distances between means of protection.

Thus, the process of protecting a military base from action or attack from the air is considered as a probabilistic process characterized primarily by the ratio of the forces of the parties.

So, it can be concluded that to evaluate the effectiveness of the combined actions of the means of fire influence and radio-electronic warfare, a generalized indicator was chosen in the form of a mathematical expectation of the number of aerial objects that did not complete their task, determined in relative terms [1]. Based on the value of this indicator, it is possible to evaluate the expected results of the actions of the means of fire influence and radio-electronic warfare, the level of losses of aircraft and the degree of their performance of tasks.

However, the reduction of the removal of the location of the electronic warfare equipment is limited by the possibility of defeating the object of protection when using a weapon that is self-guided to the radiation of the radio electronic warfare interference station.

For the deployment of means of fire influence in the CO area, a methodical technique of directed selection of possible variants of the quantitative composition of means of fire influence with their conditional deployment at fixed distances relative to the object of protection was used.

In order for the object to be protected by obstacles, it is necessary to place means of radio-electronic warfare at minimum distances from the CO, in the best case, directly on the CO.

Therefore, by applying these proposals, it is possible to significantly ensure the protection of both the object of protection and the civilian population from the aerial actions of terrorists.

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