Vital Annex: International Journal of Novel Research in Advanced Sciences (IJNRAS)
Volume: 03 Issue: 01 | 2024 ISSN: 2751-756X
http://innosci.org

Mechanism for Ensuring the Stability of Objects of the Economy in the Event of Emergency Situations

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Annotation: the article outlines the scientific basis for preparing for rapid movement at the objects of the economy in the event of an emergency. In addition, when conducting training exercises, mechanisms for the use of the necessary tools in terms of protection against emergencies of a natural and man-made nature were cited at the facilities in the regions.

Keywords: training exercises, emergency, injured ,mutual cooperation without interruption of material resources.

We will consider the issues of conducting events to prepare the population for action in emergency situations under the influence of a strong earthquake, namely the conduct of command-staff training exercises, the methodology for generating force and Means control landings in the process of eliminating the consequences of destruction in leaders and specialists in subsystems, the stages of conducting activities to protect.

Conducting training exercises allows you to determine the relevance of planning documents on the conduct of activities to protect residents and territories from emergencies of a natural and man-made nature, and also analyzes the possibility of practical development of entire complexes of these events, the territorial location of the objects of the economy, taking into account their specific aspects, production and other features.The analysis carried out in this system shows the level of security of the population and economy of the country from the consequences of situations of a natural and man-made nature that may occur, it is considered one of the most important factors that ensure the stability of the state.One of the most effective and important forms of training the leadership structure and forces of this system is command-staff training exercises.

Maintaining continuous interoperability has been found to be one of the important tasks of the leader and the operational staff in the emergency response process (Figure 1).

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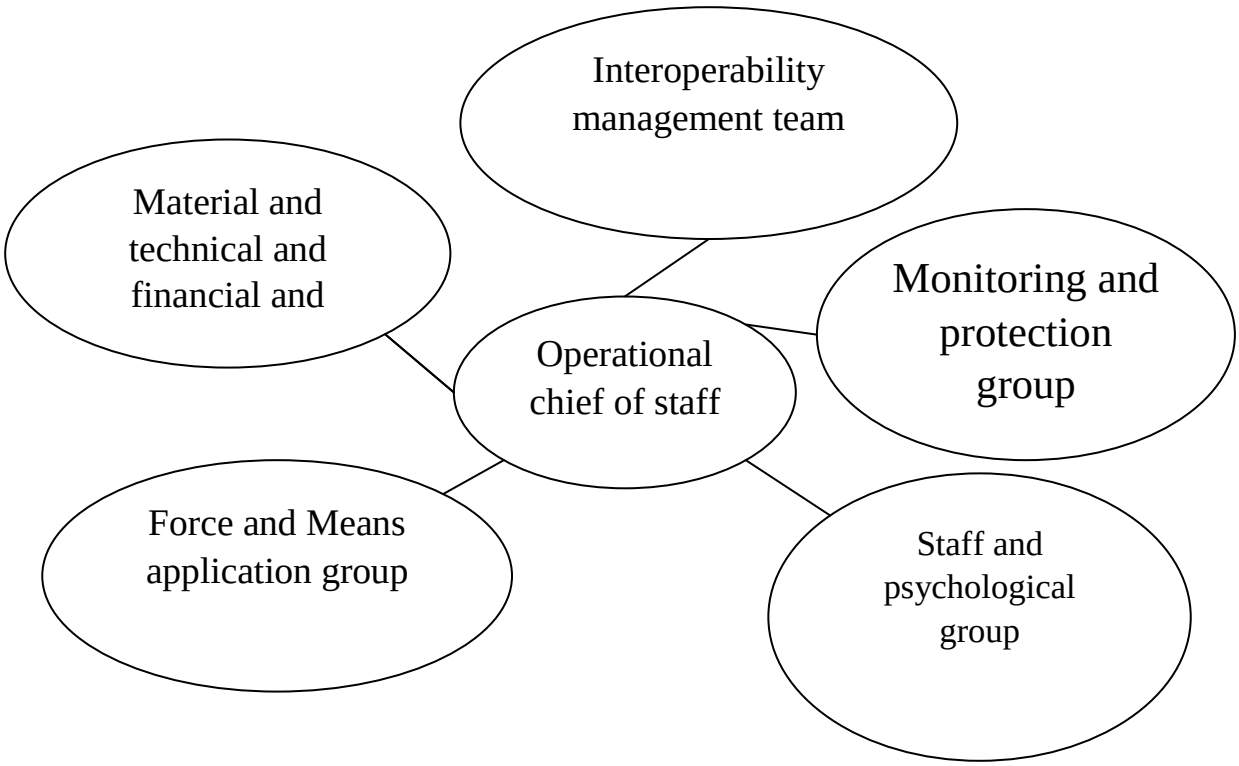

Figure 1. Scheme for organizing the interaction of the operational headquarters in the elimination of the emergency situation.

The tasks of the leader and the operational staff for the implementation of these activities include: firstly, the implementation of the envisaged procedure of the mutual actions of units in the performance of a combat task with sufficient completeness and accuracy; secondly, timely identification, additions and development of this procedure, taking into account the change in the situation; thirdly,in case of violation of their.

It has been determined that the randomness of the occurrence of an emergency situation, the scale of the scope of the area to be covered, rapid decision-making and high training of Civil Defense Forces are required. The main tasks of planning and management in the context of emergencies,finding a way to rationally distribute forces and Means, consist in determining the required number of operational services and personal content.

To this end, in order to increase the efficiency of the activities of operational services, in the elimination of emergency situations, a method of attracting forces and means that allows the rational distribution of the resources of organizations can be used.

The effectiveness of the elimination of natural and man-made emergencies is largely determined by the availability of material resources. The reserves of material resources for the elimination of emergency situations are an important component of the state system for the prevention and action of emergency situations. Their creation is expressed in the fact that it is an integral part of a complex of measures to prevent and prevent emergency situations, reduce the risk of their occurrence and reduce the possible negative consequences.

The effectiveness of work to ensure the safety of life of the affected population and the implementation of civil protection measures is given, depending on the timely material and technical support of services. Successful implementation, clear planning and proper organization of material and technical support issues of civil protection activities will be achieved. To increase the

efficiency of operational services, queuing of requirements with a high priority, changing the number of units within a certain period of time can be applied.

In this case, methods for assessing the performance of rescue services are carried out according to the following indicators:

1. Emergency elimination deadlines;
2. The number of victims rescued (in percentage from the total number of victims);
3. The amount of damage caused (in percentage proportion to possible damage, unless rescue units are involved);
4. Resources spent on emergency relief;
5. Interoperability Services (Emergency Response Forces and tools)

In turn, the reserves of material resources for the elimination of emergency situations are considered the most important and integral component of this system at all levels and are included in the complex of measures to prevent emergency situations, reduce the risk of their occurrence, as well as reduce the likely negative consequences. To predict and determine on the basis of the economic model of reserves of material means of regional subsystems, we will give the following information on the implementation of the mathematical modeling system of the process of creating and placing reserves:

A– duration of the planned period;

H– the need for the planned period;

K– premium costs;

C– cost of maintaining the unit of material means per unit of time;

П– fine for the lack of material means in the unit of time;

λ– the intensity of delivery, that is, the amount of material means requested per unit of time;

μ- the intensity of the need, that is, the material that is asked in the unit of time amount of tools;

X– maximum reserve level (storage capacity);

T– delivery period;

Л– the amount corresponding to the planned period costs;

$Л_в$.– average costs per unit time;

Л- the amount corresponding to the delivery period costs.Apriorally, the following inequalities are performed:

$$\mu<\lambda \qquad (1)$$

$$C<П \qquad (2)$$

otherwise, there is no point in the existence of a material supply system. If we assume that the condition (1) is false, then there is no way of accumulating reserves by the system, and when (2) inequality is false, it is more reasonable to pay a fine than to store something, in which case the need to create a system disappears.When modeling the material supply process and (2) we take inequalities as correct.

If the need is continuous, then the intensity μ is constant, that is, during the entire period of

operation it does not change. Fast deliveries in the mathematical model, this is a sign that delivery is higher than the intensity of need (1). That is, at the beginning of its activity (1) on the basis of inequality, the system must be in the state of X and almost immediately fill its level to the state of X, and T will be busy providing material means during the period of activity. At the end of the activity in the T period, the amount of reserves tends to zero. This system repeats the cycle. During the entire period of activity, the system spends its means on the storage of reserves.

$Л_m$ let's calculate the total costs corresponding to the delivery period. It is formed from the sum of the total costs, storage costs and surcharge costs for the delivery period. The amount of reserves in the period of activity T decreases, linearly from the top (maximum) to zero, so that during the Time T it is assumed that an average of 50% is stored from X, in this case:

$$L_t = \frac{XST}{2} + K \qquad (3)$$

To find the average cost, it is necessary to determine the ratio of cost and t value, which corresponds to the delivery period:

$$Л_e = \frac{\frac{XCT}{2} + K}{T}$$

$$\text{Here , } Л_e = \frac{XS}{2} + \frac{K}{T} \qquad (4)$$

If, during the T period, we take into account that the system determines the highest level of delivery, then the intensity of the need is determined by the following ratio:

$$\mu = \frac{X}{T} \qquad (5)$$

Here we find the following;

$$T = \frac{X}{\mu} \qquad (6)$$

(5) by pouring the expression (4), we reformulate the formula and it will look like this:

$$L_e = \frac{XS}{2} + \frac{K\mu}{X} \qquad (7)$$

It is necessary to find such an optimal X, where the average cost per unit of time should strive for a minimum. It is also necessary to take into account the factor that X cannot be a negative value.

$$\mathbf{X>0} \qquad (8)$$

Taking into account the stationarity of the process when solving this issue

Necessary, which allows us to zero the property from L_e to X, resulting in the following expression:

$$\frac{S}{2} - \frac{K\mu}{X^2} = 0$$

Reformulating it on the basis of the expression (7), we get the expression below:

$$X=\sqrt{\frac{2K\mu}{S}} \qquad (9)$$

Putting the expression (8) in (5), the following expression follows:

$$T=\frac{\sqrt{\frac{2K\mu}{S}}}{\mu} \qquad (10)$$

(8) we pour from the expression (6) and find ushbo:

$$L_e = \sqrt{2K\mu S} \qquad (11)$$

(8) - (10) expressions give the optimal values of the parameters of the model under consideration that are of interest to us.

Conclusion: the cited recommendations for improving the organization and conduct of training exercises provide an opportunity to improve the effectiveness of management decision-making and rapid response in the event of emergency and crisis situations, in which, in addition, it made it possible to organize the actions of the units of practice effectively and on time. Development of recommendations on the organization of mutual activities between the godly units participating in field command and staff training exercises, allowing to make management decisions in the event of emergency and crisis situations and increase the efficiency of rapid return. The result of the study was the search for ways to improve the stages of conducting command and staff training exercises , as well as the development of a complex of proposals and recommendations based on the application of international experience of foreign countries to improve and solve these existing problematic issues.

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