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Organization of Evacuation of Residents from the Area Where Emergency Situations Have Occurred

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Annotasiya: The article shows a generalized method of calculating the forces and means necessary for the organization of the evacuation of the population from the area where emergency situations have occurred, as well as for the elimination of the emergency situation.

Keywords: Power and tools, rescue, elimination, training exercises, financial and material resources.

All stages of human development are closely related to the world around him, he feels the problems arising from living in a highly developed society, even more in himself. By the present time, the dangerous human intervention in nature has sharply intensified, the scale of this intervention is expanding, and this threatens to become a global threat to humanity.

Almost every day in different parts of the planet, various situations occur, known as emergencies. These are media reports of accidents, natural disasters, subsequent accidents, military conflicts or terrorist acts. Due to the fact that there is a sharp increase in the number and scale of emergencies, the need to carry out a complex of rescue and other non-deferred work increases and requires an increase in the time and quality level of conducting it.

A special place is occupied by the geologo-geographical location of our country, the protection of the population and territories from emergencies of natural, man-made and ecological nature that can occur due to their climate, the safety and health of people's life activities, which is why this area has become one of the priorities of the policy of our state.

Natural disasters are dangerous in that accidents and disasters that occur in production occur unexpectedly. When we anticipate emergencies and plan measures to reduce their consequences in advance, it will be possible to prevent or reduce the number of casualties they can bring. First of all, it is necessary to prepare in advance the forces and Means for the organization of Accident-Rescue and other non-delay work. To do this, it is important that the composition of the responsible leaders, specialists are perfectly aware of ways and methods to eliminate the consequences of emergency situations, and have practical knowledge in this regard [3].

Analysis of major emergencies that have occurred shows that among them, strong earthquakes are characterized by their severe consequences. This disaster, which does not choose time, can lead to hundreds, thousands of human casualties and a huge amount of economic damage in a matter of seconds. Emergency situations associated with an earthquake threaten not only a person, but also Society, the state and the whole being. Therefore, measures to prevent and reduce the consequences of emergency situations associated with an earthquake are one of the pressing problems that are necessary to solve, which are of interest not only to individuals, but also to the state and the world community[3].

- The main tasks of operational planning and management of the population in emergency situations from the effects of a strong earthquake are to determine the optimal distribution of personal composition and the number of operational units. Despite the fact that there is almost no way to find an exact solution to such types of issues, the use of formal methods in this area can be successful enough. To this end, it has been anicalized that high priority requirements for operational efficiency of operational units can be selectively queued, changing the number of units within a given period of time. In this case, methods for assessing the effectiveness of the work of accident and rescue units are carried out according to the following parameters:
- emergency elimination deadlines;
- the number of victims rescued (in percentage from the total number of victims);
- the amount of damage caused (in percentage proportion to probable damage, unless accident-rescue units were involved;
- resources spent on emergency relief;
- Coordinated services (number of Emergency Response Forces and Means) [2].

From this, a methodology for distributing forces and means, taking into account the strategy of emergency relief, productivity (efficiency) of forces, location and costs of their use, is proposed. On the basis of a generalized methodology for calculating the forces and Means Necessary for the elimination of an emergency situation, the following was determined:

$Q=\sum_{i=1}^{n} \frac{W_r}{V_j T_r} q_{P_r} q_{C_r}$ (1)

here: W_r –r- the size of the type of work;

r– types of emergency rescues;

V_j --r- types of work daj–the average volume of work performed by one unit of the unit;

j-r- type of rescue unit involved in the type;

T_r-r-time to perform type work;

q_{P_r}–r-correction factor of weather conditions in type work;

q_{C_r}-r- the coefficient of Correction of the time of day in type work.

In the formulas for calculating forces and means, the time of work is given, not taking into account the rest of the rescuers. The work shift of rescuers is 3-5 hours, taking into account the complexity and intensity of work.The total duration of work should not exceed 12 hours per day. In this case, the duration of rest is determined as follows: every 45 minutes after work– 15, after the end of the work shift–3 hours.

$$T_{soat} = T_3\, 0.25(soat), \text{(2)}$$

here:T_3 – time given to emergency relief. The rest time with a shift to the day is as follows:

$$T_{sutka} = \frac{T_3 + \left(\frac{T_3\, 3}{T_S}\right) + T_3\, .0.25}{25} (soat) \text{ (3)}$$

The total time of emergency response, taking into account the rest time of rescuers, constitutes the following:

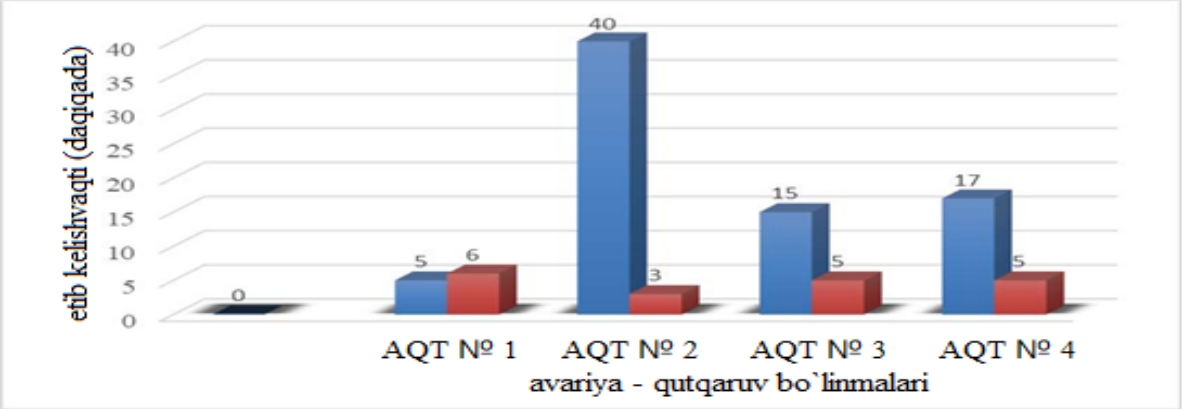
$$T_{UMUM} = T_3 + T_{smenalar} T_{soat} + T_{SUTKA}\, 12 \text{ (4)}$$

From this, it was proposed to find a time parameter such as waiting at a temporary dislocation site:

$$T_{F,V} = T_1 + T_2 + T_3$$

$$T_{F,V} = T_1 + T_2 + T_3 + T_{KV}$$

here, $T_{f.v.}$– emergency elimination time, T_1– quick situation detection time, T_2 – time to make a management decision, T_3 – time of execution of the decision made, $T_{k.v.}$– waiting time at the place of temporary dislocation.



Evaluation results taking into account the effectiveness of the work of evacuation units, the minimum (minimum) and the maximum (maximum) arrival time.

In this case, the time spent on emergency relief is as follows:

$$T_{ф.в} = T_1\ (T)\Delta T_1 + T_2\ (T)\Delta T_2 + T_3\ (T)\Delta T_3 + T_{кв}\ (T)\Delta T_{кв} \quad (5)$$

$$T_{ф.в} = \int_{T_0}^{T1} T_1\,(T)dT \quad + \int_{\tau_0}^{T_2} T_2\,(T)d\,T \quad + \int_{T_0}^{T_3} T_3\,(T)d\,T \quad \int_{T_0}^{T_{к.в.}} T_{к.в.}\,(T)d\,T \quad (6)$$

$$T_{ф.в} = (T_1 + T_{к.в.}) + (T_2 + T_{к.в.}) + (T_3 + T_{к.в.}) \quad (7)$$

As a result of the analysis carried out, it was found that fast time is determined by the time the commander and staff are required to carry out the entire volume of management activities in real conditions of the situation (not just training exercises), and the units are assigned crash-rescue work and the tasks assigned.

It is determined that work on the practical creation of reserves of financial and material resources should be carried out, constantly improving the nomenclature of reserves of material resources (pre-accumulation of reserves of resources of the required size, in districts with a very high probability of emergencies). It is necessary to identify and take into account the sources of resource acquisition, and on the basis of this, develop supply plans. It is required to find additional sources of obtaining material resources. Due to the fact that not all needs can be satisfied at the same time, plans are drawn up in which their use is determined depending on the step-by-step, sequence of procurement of material resources, available financial resources and other opportunities.

The effectiveness of training exercises is mainly due to the speed with which management decisions are made, the rational distribution of forces and means of units and the effectiveness of the actions of the governing bodies of the state system of emergency prevention, elimination. When assessing effectiveness, all required work is required to be performed in accordance with the developed strategy for the development of an emergency and crisis situation and its consequences.

Thus, the following recommendations have been proposed to ensure the successful organization of the tasks set in conducting training exercises and the effective mutual cooperation of the units:

Organization of the emergency response staff and re-establishment of the management system;

determination of the reasonable need of departments for them based on scientific normalization

and experimental data on the expenditure of material and technical resources;

Rational distribution of material supply logistics centers, taking into account the transport system of Regions, geographical location, availability of logistics potential, security and vulnerability to various emergency situations.

Conclusion

Taking into account the rapid situation in case of emergency and crisis, the following conclusions were reached regarding the improvement of the organization and conduct of command and staff training exercises:

1. Introduction of clarification on the calculation of forces and means that allow to increase the level of preparation for training exercises and the provision of units intended for the elimination of emergency situations, the necessary material resources in eliminating the consequences of emergency situations;
2. A mathematical model for the rational distribution of reserves of material resources of regional units has been developed, which allows you to optimize the time and distance for the supply of funds to the emergency zone, which in turn ensures the adequacy and rationality of the distribution of material resources and immediately eliminates the immediate danger to human life and health, eliminating the consequences of.
3. Recommendations have been developed on the organization of mutual activities between territorial units participating in training exercises, allowing to increase the effectiveness of management decisions and rapid response in the event of emergency and crisis situations.

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