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SUBSTANTIATION OF THE METHODOLOGY FOR CALCULATION OF FORCES AND EQUIPMENT OF UNITS SENT FOR CONDUCTING COMMAND-STAFF EXERCISES

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Annotation

The article defines the tasks of ensuring the safety of the population, identifies ways and means of protecting the population, and presents the results of comprehensive measures. The necessity of conducting command and staff and complex exercises is substantiated. The method of distribution of forces and means with application of the generalized method of calculation of forces and means necessary for liquidation of an emergency situation is offered. Based on the results of the evaluation of the effectiveness of the work of emergency rescue units, based on the time, the total time of emergency response necessary for the commander and staff to carry out the entire scope of measures has been established.

Keywords: security, population, emergency situation, rescue operations, events, exercises, civil protection, ытatement, practical activities.

At present, much attention is paid in the Republic of Uzbekistan to security issues in emergency and crisis situations. The successful solution of the tasks of ensuring the safety of the population largely depends on the level of preparedness and development of comprehensive measures, methods and means of protecting the population, life support systems, material reserves and reserves from the consequences of emergency and crisis situations, as well as coordinated actions of government bodies at all levels of the state system. Command-staff and complex exercises occupy an important place in the system of training of command and control bodies of forces and means of the state system for preventing and eliminating emergency situations in the field of population protection. Today, they are becoming even more relevant.

The effectiveness of conducting command and staff exercises largely depends on the promptness of managerial decision-making, the optimal distribution of forces and means of subdivisions, and the effectiveness of the actions of the management bodies of the state system for preventing and eliminating emergency situations. Performance is a strategic indicator and serves to assess the degree to which the system achieves its goals, the intensity of maintenance and the degree of completion of the work package.

When evaluating the effectiveness, it is necessary to establish whether all the required work is being carried out in accordance with the development of an emergency and crisis situation and the developed strategy for eliminating its consequences, whether these works are being carried out effectively, i.e. whether results are achieved with the required quality and within the stipulated time. To measure the effectiveness, it is necessary to compare the degree of implementation of planned work, i.e. compare what needed to be done with what was actually achieved.

The composition of forces and means should ensure the implementation of measures to search for victims, rescue them, provide medical assistance, temporary resettlement to safe areas and medical institutions, extinguish fires, localize and eliminate sources of secondary damaging factors, accommodate and sustain victims (Fig. 1.).

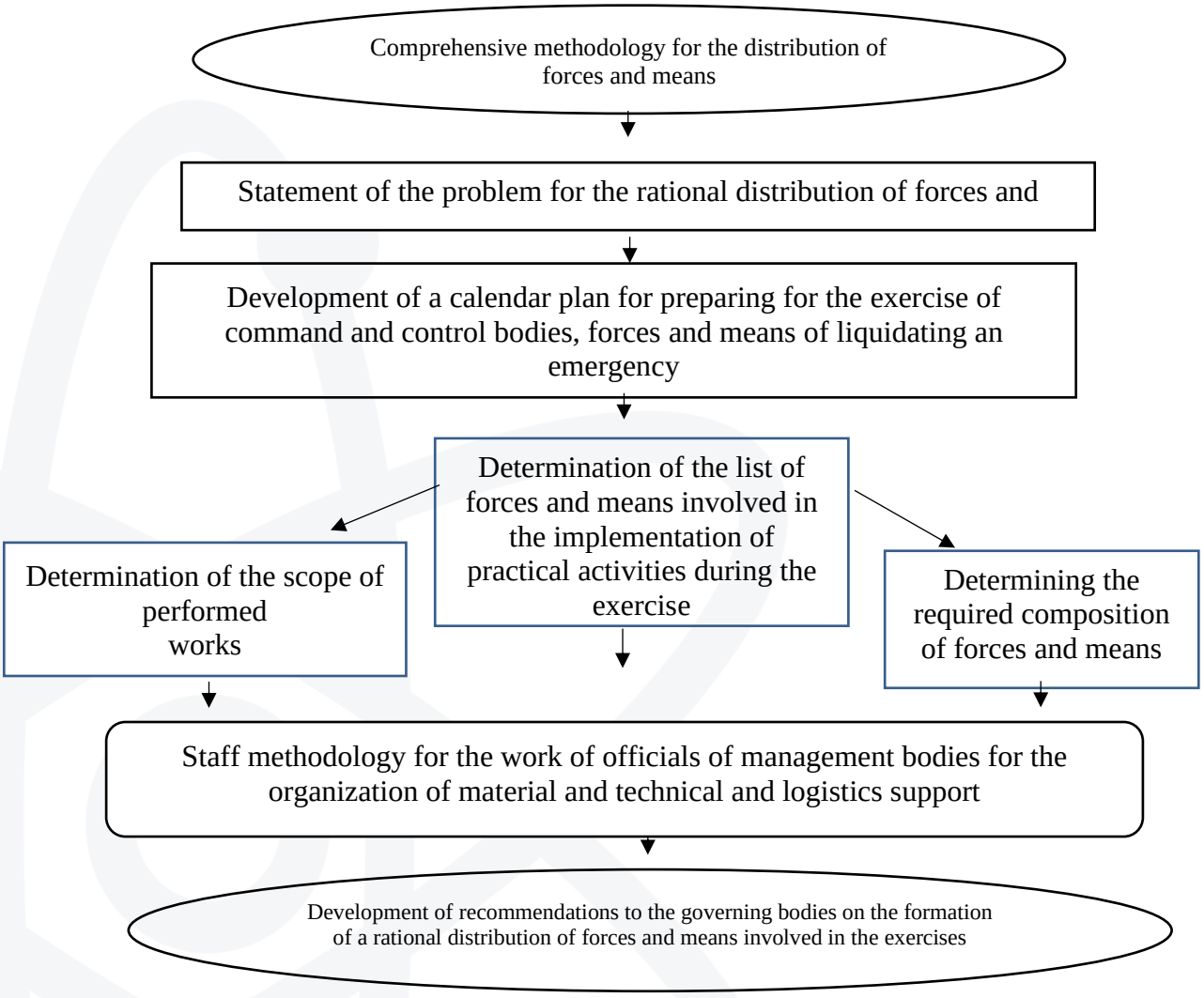

Fig.1. The procedure for the distribution of forces and means involved in the elimination of emergency situations

The introduction of forces to the site (objects) of work should be carried out taking into account their readiness for action. First of all, duty formations and permanent readiness formations should be introduced, the rest - as they are deployed.

The allocation of forces and means is carried out in order to provide mutual assistance to eliminate the consequences of accidents, catastrophes and natural disasters in the most important potentially dangerous territories and economic facilities that can significantly affect the livelihoods of the population and civil protection forces. To do this, with a lack of available capabilities, forces and means of the State Emergency Service and the State Defense Ministry, specially trained detachments, formations, military units, subunits, teams (formations) of constant readiness and general-purpose forces (in accordance with the developed interaction plans) are allocated.

It is quite obvious that during the liquidation of emergency situations, the material resources of the reserve are used, which must be replenished in a timely manner to the established volume. Regulation of the frequency and size of replenishment of volumes is the main content of the process of managing reserves of material resources. to improve the efficiency of the functioning of operational units, a method of attracting forces and means in the liquidation of emergency situations can be used, which allows rational distribution of the resources of departments.

The effectiveness of work to eliminate the consequences of crisis and emergency situations, the life support of the affected population and the implementation of civil protection measures depends on the timely logistics of the units. Successful fulfillment of the tasks of logistical support of civil protection measures is achieved by advance, clear planning and proper organization of logistics, identification and mobilization of material resources, their correct placement and use.

Based on this, a method for distributing forces and means is proposed, taking into account the emergency response strategy, the productivity of forces, the location and costs of their use (Fig. 2). Based on the generalized methodology for calculating the forces and means necessary to eliminate the emergency, the following is determined:

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

where W_r is the amount of work of the r -th type;

r - type of rescue work in an emergency;

V_j - the average volume of work performed with the r -th type of work by one unit of the j-th formation;

j - type of rescue formation involved in the r -th type of work;

T_r - time to perform the r -th type of work;

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q_{P_r}- correction factor for weather conditions for r - th type of work;

q_{C_r} - correction factor of the time of day for the r -th type of work.

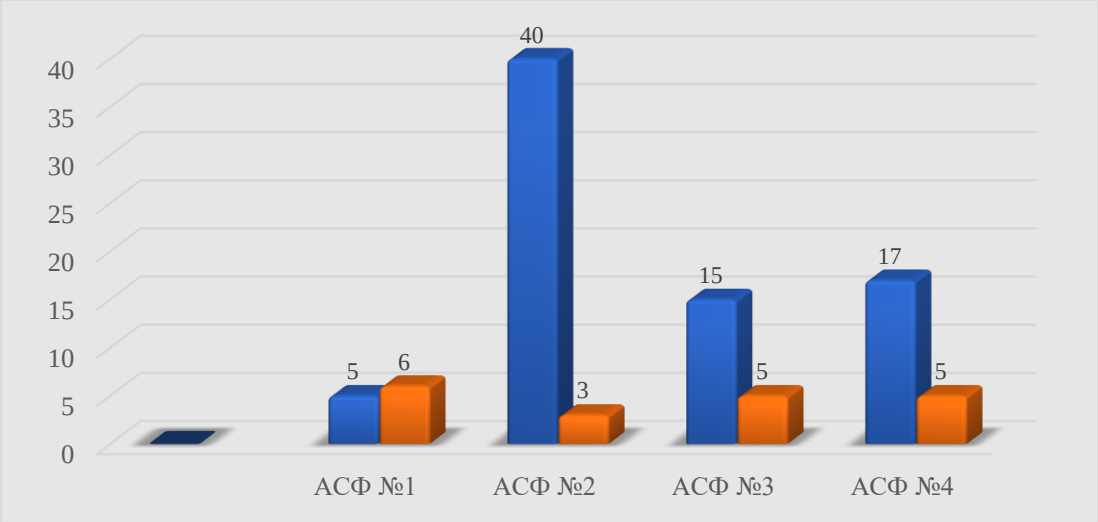

Fig. 2. Results of evaluating the effectiveness of the work of emergency escue teams

The time of work in the formulas for calculating the forces and means is set without taking into account the rest of the rescuers. The working shift of rescuers is 3-5 hours, taking into account the severity and intensity of work. The total duration of work should be no more than 12 hours per day. In this case, the duration of rest is set: 15 minutes - after every 45 minutes of work; 3 hours - after the end of the work shift.

Then the calculation of the hourly rest time will be:

$T_{hour}=T_з \cdot 0.25(hour)$,

where $T_з$ is the time set for emergency response.

The shift rest time per day will be:

$$T_{day} = \frac{T_3 + \left(\frac{T_3}{T_S} \cdot 3\right) + T_3 \cdot 0{,}25}{24}(hour),$$

The rest time of rescuers per day is calculated according to the condition, if

$$T_{day} < 1, \text{ then } T_{day} = 0$$

The total time for liquidation of an emergency, taking into account the rest time of rescuers, will be:

$$T_{act} = T_3 + T_{change} T_{час} + T_{change} \cdot 12$$

Based on this, it was proposed to find such a time parameter as the waiting period at the place of temporary dislocation.

$$T_{em} = T_1 + T_2 + T_3$$

$$T_{em} = T_1 + T_2 + T_3 + T_{wt}$$

where, T_{em} - the time of liquidation of the emergency, T_1 - the time of determining the operational situation, T_2 - the adoption of a managerial decision, T_3 - the implementation of the decision, T_{wt} - the waiting period at the place of temporary deployment.

In this case, the time taken to clean up the consequences of an emergency:

$$T_{em} = T_1\,(T)\Delta T_1 + T_2\,(T)\Delta T_2 + T_3\,(T)\Delta T_3 + T_{wt}(T)\Delta T_{wt}$$

$$T_{em} = \int_{T_0}^{T1} T_1\,(T)dT \;+ \int_{\tau_0}^{T_2} T_2\,(T)d\,T \;+ \int_{T_0}^{T_3} T_3\,(T)d\,T \;\int_{T_0}^{T_{п.в.}} T_{wt}\,(T)d\,T$$

$$T_{em} = (T_1 + T_{wt}) + (T_2 + T_{wt}) + (T_3 + T_{wt})$$

Studies have established that the operational time is determined based on the time that would be required in real conditions for the commander and headquarters to carry out the entire (and not just practiced in the exercise) volume of measures to control the formations, and the formations - to prepare for the conduct of emergency rescue operations and fulfillment of assigned tasks.

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