

MATHEMATICAL ACCOUNT OF EFFICIENCY OF ACTIVITY OF SUBDIVISIONS AT THE EMERGENCY AND CRISIS PHENOMENA

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Annotation

Article describes the conditions of implementation of international norms of cooperation in emergency situations. It is suggested to start working on implementation of consulting committees in actions of consolidated headquarters, which are created for liquidation of the consequence of Emergency Situation. Also, there are mathematical grounds of the effectiveness of present version of work of consultants, which are enriched with the experience of activity of rescuing the damaged in critical and extreme events. The coactivity in Emergency Situations, which is considered as precondition of analyzing of operative situation.

Every department or authority in definite step needs information and depending on its sphere of activity should have statistical material which concerns own class of contingent. More activities of departments and power structures may be effective only in condition of high level of operation that, in its turn, may hardly depend on

immediate entry of necessary information. Receiving of information depends in different ways on the level of adjustment of cooperation.

In condition of emergency situations power structure begins to take part in almost every levels or steps of cooperating from duty unit to international. In this situation changing information between departments should be in full range of cooperation. The necessity of organizing the coactivity between units of MES and other common active units, authorities in emergency situations.

- Especially this organ performs complex interconnectivity and interdependent functions, realizing of which is directed to solving the united problem that will consolidate legality and law-and-order liquidation of consequences of emergency situation and elimination of defects of those generative.

- The measures directed to solving the particular united problem can be effective only in case they are realized separately,

but in base of coactive planning and correcting co-directional activity power.

- Coactivity of action of these organs excludes parallelism and duplication, increases the effective usage specifically for each of those methods and forms of labor.

- Reliable system of coactivity can be a mechanism of increasing the stability of process, which will guarantee the safety of a system, that influences the facts of Emergency Situation.

Coactivity between departments is divided into several levels and steps. But in process and mechanism of coactivity of power structures in emergency situation enough impact in present time already show implementation of international standards.

In scheme also, one can see that for liquidation of the consequences of

Emergency Situations there is necessity for clear law regulation in every step of coactivity. In practice, usually event of applying the activity of emergency situations is not limited only in one region or in province but goes beyond to several provinces and even to countries. In this sphere, Uzbekistan has already approved a number of documents, especially published several interdepartmental orders and uniting decisions of the Cabinet of Ministers, also set interdepartmental normative documents; our country joined to a set of international conventions that regulate the problems of coactivity in rendering help in emergency situations and uniting the effort of the country in localization of consequences of Emergency situation in the area of disaster.

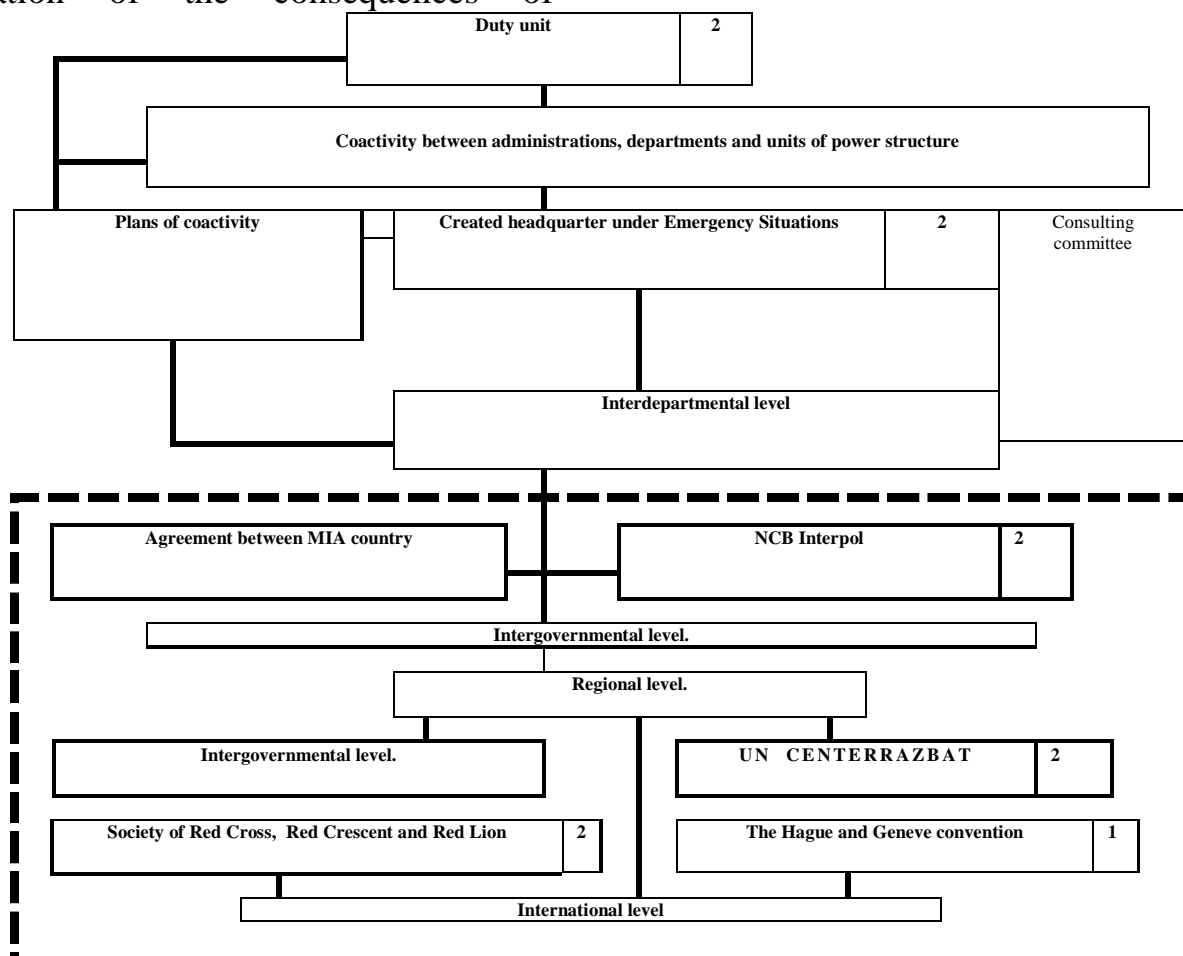


Fig. 1. The levels and steps of coactivity in Emergency situations:

1 – The possibility manifestation that or this step coactions in documents;

2 – The centers of administration (especially, centers through that manifested coactivity). Implemented are of areas of coactivity levels.

The acquisition of independence by the government of Uzbekistan in the aim of bilateral agreement and regional coactions make several contracts in the border of CIS or between certain countries.

In Uzbekistan there is orderly and enough efficiently functioning active system of informational and organizational coactivity in Emergency Situation. At the same time, in the aim of improvement of activities the power structure in this sphere, regular and systematical enough, improve every part of safety mechanism of society in Emergency Situation, analyzing accumulated domestic experience and studying advanced experience of foreign countries.

In the base of generalization of domestic and foreign experiences put in set of suggestions are directed to improvement of this activity. In particular, necessity of creation and improvement of unified local informational computer set within every interested ministry and authorities created system of tolerance.

The usage of local facts (usage of consultants) control of Emergency Situations can be expressed by this formula:

$$t_1+t_2+t_3 \geq t_1^c + t_2^c + t_3^c + t_k \quad (1)$$

t_k – time of expended on call and usage of consultants;

t_{qc}^c – time of expended on localization Emergency situation in using of experts;

t_i^c – time of expended for strict step with using of consultants;

$$t_1 = t_1^c + \Delta t_1^c; \quad t_2 = t_2^c + \Delta t_2^c; \quad t_3 = t_3^c + \Delta t_3^c \quad (2)$$

где: Δt_i^k – increment (difference) of time used in direct step of using the consultants;

$$\sum \Delta t^k = \Delta t_1^k + \Delta t_2^k + \Delta t_3^k \quad (3)$$

$$t_{qc}^c = (t_1 - \Delta t_1^k) + (t_2 - \Delta t_2^k) + (t_3 - \Delta t_3^k) \quad (4)$$

$$t_{ES}^k = t_{ES} - \sum \Delta t^k \quad (5)$$

$\sum \Delta t^k$ – Sum of difference (increment) changing the time from using the consultants;

In that case the complex increment will look

$$t_2^1 = t_2 - \Delta t_k^2 - \Delta t_{tc}^2 - \Delta t_p^2 - \Delta t_k^2 \quad t_1^1 = t_1 - \Delta t_k^1 - \Delta t_{tc}^1 - \Delta t_p^1 - \Delta t_k^1 \quad (6)$$

$$t_3^1 = (t_1 + t_1^1) + (t_2 + t_2^1) + t_3^1 - \Delta t_k^3; \quad t_3 = t_3^1 - \sum \Delta t_i^1 - \sum \Delta t_j^2 + \Delta t_k^3$$

$$t_{ES}^1 = t_1^1 + t_2^1 + (t_3^1 + \sum \Delta t_i^1 + \sum \Delta t_j^2) - \Delta t_k^3$$

$$t_{ES}^1 = t_1^1 + t_2^1 + (t_3^1 + \Delta t_k^1 + \Delta t_{tc}^1 + \Delta t_p^1 + \Delta t_k^1 + t_{tc}^2 + \Delta t_p^2 + \Delta t_k^2) - \Delta t_k^3 \quad (3.13)$$

The usage of consultants admits existence of requirements, in case of sum “ $t_{E.S.}(I) + t_k$ will be smaller $t_{E.S.}(r)$ ”

$$t_{E.S.}(I) \leq t_k + t_{E.S.}(r) \quad (7)$$

Here $t_{E.S.}(I)$ – time of liquidation of consequence of E.S.;

$t_{E.S.}(r)$ – real time, used for liquidation of consequence of E.S. or time used for localizing ES in using consultants;

t_k – used time for call and usage of knowledge of consultants;

$$t_{ES}^c = t_{qc}^c - \sum \Delta t^k \quad (8)$$

$\sum \Delta t^k$ – the sum of increment (difference) changing the time from using of consultants;

It's Necessary to apply in counting from minimum $\Delta t^k = 0$ to maximum $\Delta t^k = t_{qc}^c$.

The integration gives (2)

Where $R = t_{ES}$; $S = t_{ES} \rightarrow \min =$
 $R \rightarrow \min$

R – maximum time. t.e.s.; S – minimum time t_{ES} ;

$$t_{ES} = t_{ES} - t_{ES}R - t_{ES}S = t_{ES}(1-R-S)$$

(9)

$$k = (1-R-S) \quad (10)$$

In present event k – is coefficient which accounts for different steps of effective usage of consultants (experts). Mathematically it illustrates the coefficient of connection between t_{ES} (passed time till present, for example passed time until point “E”) and t_{ES} (time for localizing ES using consultants).

Thus, it shows, that in $\sum t_1 \rightarrow \min \sum t_1$ will become acceptable, that $\sum t_2 \rightarrow \max \sum t_2$, $\sum t_3 \rightarrow \max \sum t_3$. In the result this can lead to decrease t_{ES} . The implementation of created headquarters of consultants into the structure may be considered as “satellite” in defending system (as in extraordinary law). “Consulting committee” present one more mechanism of guaranteeing the safety system, that will influence affected facts.

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