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## **THE MISSION FORMALIZATION FOR THE PREVENTIVE REDUCTION OF THE NEGATIVE GEOPOLITICAL PROCESSES AND MILITARY-POLITICAL SITUATION IMPACT ON THE MILITARY SECURITY OF THE STATE ENSURING**

**Abstract.** *The article is aimed at reforming the security and defense sector of Ukraine, that involves a more rational use of existing forces and means to ensure a sufficient level of military security of the State. The practical implementation of this goal requires the development of a unified system of joint management, methods of joint use of force and non-force subjects of the security and defense sector of Ukraine, improvement of the methodological apparatus for determining tasks for these subjects and assessing the effectiveness of their implementation. This is precisely why it is necessary to formalize the task of preventively reducing the impact of negative processes (threats) of the security environment on the level of military security of the State. The developed version of the formalization of the task allows us to substantiate two target functions of ensuring the military security of the State. The first is to determine the necessary level of de-escalation of the identified threat, the second is to preventively reduce the impact of negative trends of the geopolitical and military-political situation on the processes of ensuring the military security of the state on the basis of limiting the risks of the most dangerous negative trends at the stage of their provoking crisis situations in the target state. The above indicators reveal the essence of de-escalation of a military threat, which consists in reducing or stopping the action of threat-forming factors by targeted influence on them by entities of the security and defense sector of Ukraine, which should reduce the level of risks of using military force against Ukraine in order to prevent its unacceptable (critical) value, at which a military conflict becomes a reality.*

**Keywords:** *military security, formalization of tasks, negative trend, de-escalation of threats, risks, security environment.*

### **Introduction**

**Statement of the problem.** According to the current guiding documents on the National Security Strategy of the State [1-2], the reform of the security and defense sector of Ukraine (SDSU) should be aimed at the rational use of available forces and means to ensure a sufficient level of military security of the State.

The practical implementation of this requirement requires the development of a unified system of joint management, methods of joint use of force and non-force subjects of the SDSU, improvement of the methodological apparatus for defining tasks for these subjects and assessing the effectiveness of their implementation. This requires the correct formalization of the task of de-escalating threats and reducing the impact of negative trends in the security environment on the level of military security of the State.

**Analysis of recent research and publications.** In the monographs [3-5], the authors consider hybrid warfare as an integration of various real and virtual threats (diplomatic, military-economic, informational, etc.) with the aim of psychologically influencing the victim state (target), plunging it into a situation of uncertainty, destroying it without declaring war, and also creating a corresponding information environment around it, which should form an image of this state in the world community that would justify any unfriendly, even aggressive actions against it. However, the authors did not consider the issues of assessing and analyzing negative trends in the geopolitical and military-political situation (MPS).

The monograph [6] describes in detail the changes in the modern security environment (SE), concludes that it is nonlinear. However, the author does not provide a methodology for assessing and analyzing negative trends in the development of the security environment.

The publication [7] provides principles and basic methodological recommendations for organizing and conducting various types of tasks formalization, that may be taken into account to solve the problem.

The article [8] presents an applied methodological approach to formalizing the management of a crisis situation de-escalation process during an international peacekeeping operation. However, the author does not consider technologies for analyzing negative trends in the security environment.

The above-mentioned and other publications that the authors were able to read do not provide a methodological framework for assessing the level of hybrid threats and their destructive impact, if fully implemented, on key areas of national security, as well as their impact on the risks of ensuring the national security of the state.

**The goal of the article** is the task formalization of the threats de-escalating and the impact of negative trends in the security environment reducing on the level of military security of the State.

## Presentation of the main material

The task of threats de-escalating and the impact reducing of negative trends in the security environment on the military security of the State is one of the most important. The experience of strategic decisions preparing on the crisis situations settlement indicates the need to have significant amounts of input information (an idea of the essence of the conflict; motivation and driving forces of the conflict; conflict-generating factors of various nature (political, economic, national-ethnic, ideological, socio-cultural and their significance; information about the policy of international security institutions regarding this crisis situation, etc.).

Without this array of information in a form acceptable not only for comprehension but also for the necessary calculations, developing informed decisions becomes problematic.

The issue of the State national security, in particular ensuring military security, has been considered in many specialized and general publications [4-6; 8-10]. However, in most of them, insufficient attention is paid to methodological problems, especially regarding the formalization of the de-escalation of threats process and the destructive impact of negative trends in the security environment using force and hybrid methods and means.

Formalizing the threats de-escalating task to military security and defining a system of indicators for assessing the effectiveness of military-political decisions being made is a necessary step for forming the potential for neutralizing threats to the military security of the state, which in

its essence determines a partial strategy for countering threats of a military nature and negative trends in the security environment using force and hybrid methods and means.

The quality of the military security system functioning depends on the methodological principles underlying the organization of this process.

The term “organization” in this case is considered in terms of a set of actions leading to the formation and improvement of relationships between parts of the whole, that is, a set of measures for the use of military and non-military forces and means (subjects) of the SDSU in the course of preparation and participation in the de-escalation of threats to the military security of the State. Therefore, it can be considered that we are talking about providing the above-mentioned set of measures with the features of a system with the corresponding systemic properties. This makes it possible to apply a systemic approach with its important principles for further consideration of the problem of formalizing the process of ensuring military security.

One of these principles is the principle of formalization [7], aimed at obtaining quantitative performance, creating methods that narrow the ambiguity of concepts, definitions, assessments, etc. In the process of formalization, objects (processes), their properties and connections need to find stable, identical and accessible indicators in order to identify and fix the essential aspects of the object (process). Formalization allows you to clarify the content by identifying its form and can be carried out with varying degrees of completeness and direction.

It is proposed to understand the formalization of the process of ensuring the military security of the state as the identification and description, both verbal in certain terms and numerical [7], of the components of this process and their relationships that determine the target function of the process.  $W_{cfs}$  in  $s$  in the field of national security.

Without determining the quantitative characteristics (indicators) of the components and the connections between them, it is impossible to build any effectively functioning complex system focused on preventing armed aggression against the state. In our opinion, such characteristics should include those that reveal the capabilities of individual components of the SDSU to perform the tasks assigned to them and provide the most accurate idea of their essence and potential.

In general, the capabilities of subjects (individual components) of the SDSU to de-escalate threats to the military security of the State are determined by their functional purpose in the system of state institutions (the spheres of state activity that they are responsible for - political, economic, military, information, cyber, etc.). This becomes the basis for the formation of a set of indicators, according to which it is possible to further formalize the process of de-escalation of threats and reduce the impact of negative trends in the security environment on ensuring the military security of the state.

Among the specified set of indicators, it is proposed to have the following groups:

– list of spheres of state activity  $\Pi_{is}$ , which this SDSU entity is responsible for (for example, in the form of a matrix of spheres  $\|\Pi_{is}\|$  where  $i = \overline{1, I}$  – SDSU subject,  $s = \overline{1, S}$ ;

– priorities for each area  $i$ -th subject, if there are several such spheres;

– list and possible scope of tasks that the  $i$ -th subject of the SDSU can perform for each of its inherent  $S$  spheres;

– indicators characterizing the threat itself [5] (according to the Threat Passport), in relation to which a decision has been made to de-escalate, and expert assessments of the expected time intervals of the “response” to the impact  $i$ -th subject of SDSU on  $F$  factors that form this threat;

– indicators characterizing the identified negative trend in the security environment ( $T_{si}^n$ ), in relation to which a decision has been made to weaken its influence on the military security of the state;

– indicators that provide a description of the task(s)  $i$ -th subject of the SBOU regarding the de-escalation of the threat (scope of a specific task, time and procedure for starting to influence

the threat factors, deadlines for countering the threat, required level of de-escalation of the threat)  $\Delta K_{p\partial 3}(T_{np})$ , the permissible level of reduction in the impact of the negative trend of the security environment, the level of military danger of the threat  $K(t)$  during its de-escalation, the level of military danger created by the identified negative trend, etc.

The above indicators reveal the essence of de-escalation of the threat of a military nature, which consists in reducing or stopping the action of the factors forming the threat by targeted influence on them by the subjects of the SBOU, which should reduce the level of risks of the use of military force against Ukraine in order to prevent its unacceptable (critical) value, at which a military conflict becomes a reality.  $K(T_{np})$ , Fig. 1.

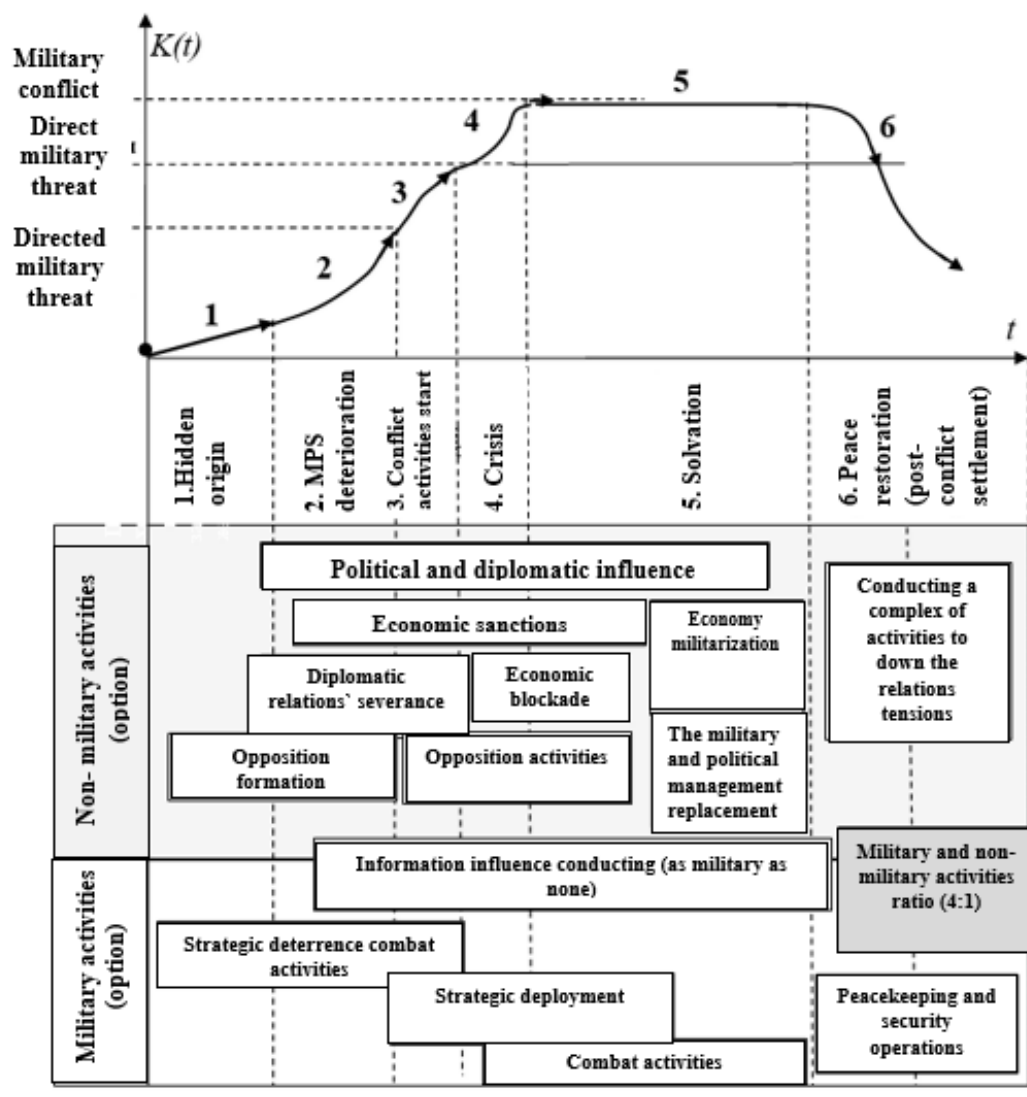


Fig. 1. The main phases (stages) of the hypothetical development of a military conflict and some possible military and non-military measures (forms) to prevent it at different stages of development: 1 – manifestation of a conflict of interests; 2 – development of differences into contradictions and their awareness by the military-political leadership; 3 – deepening of contradictions; 4 – crisis response; 5 – localization of the military conflict; 6 – de-escalation of the military conflict

The value of the reduction in the current level of military danger  $K(t_1)$  to the threshold is called the “threat de-escalation level” at the time  $t_1$ .

So, a “threat de-escalation level” is needed  $\Delta K_{\text{pдз}}(T_{\text{np}})$  during its de-escalation, it can be presented as follows:

$$\Delta K_{\text{pдз}}(T_{\text{np}}) = f(I, S, \Pi) \quad (1)$$

The main phases (stages) of the development of a hypothetical military conflict and some possible military and non-military measures (forms) to prevent it at different stages of development are shown in Fig. 1 [8-10].

It is clear that the greatest effect from the use of forces and means of the SDSU can be achieved only if the comprehensiveness, systematicity, coherence, reachability, specificity, flexibility and acceptability of the tasks that must be assigned (defined in advance) to the executors, that is, the SDSU subjects, are ensured.

If the above conditions are met, it becomes possible to justify the most rational set of tasks for SDSU entities based on the criterion of minimal risk of aggravation of the situation, which have the appropriate forces and means, which can provide a sufficient synergistic effect at each of the stages of de-escalation of the threat.

The timeliness and adequacy of decisions made and tasks assigned to SDSU entities complement the general requirements for organizing the process of de-escalation of military threats and preventive response to negative trends in the security environment.

Naturally, all the requirements listed above will acquire a specific content depending on the nature of the identified threat, the purposefulness of the identified negative trends in the security environment and the completeness of the formalization of the entire de-escalation process, a component of which is the formalization of tasks for the SDSU subjects. A general typical scheme for the formalization of tasks for the SDSU subjects regarding the de-escalation of a military threat and the weakening of the impact of negative trends in the security environment through the use of military and non-military forces and means of the SDSU is shown in Fig. 2 [7].

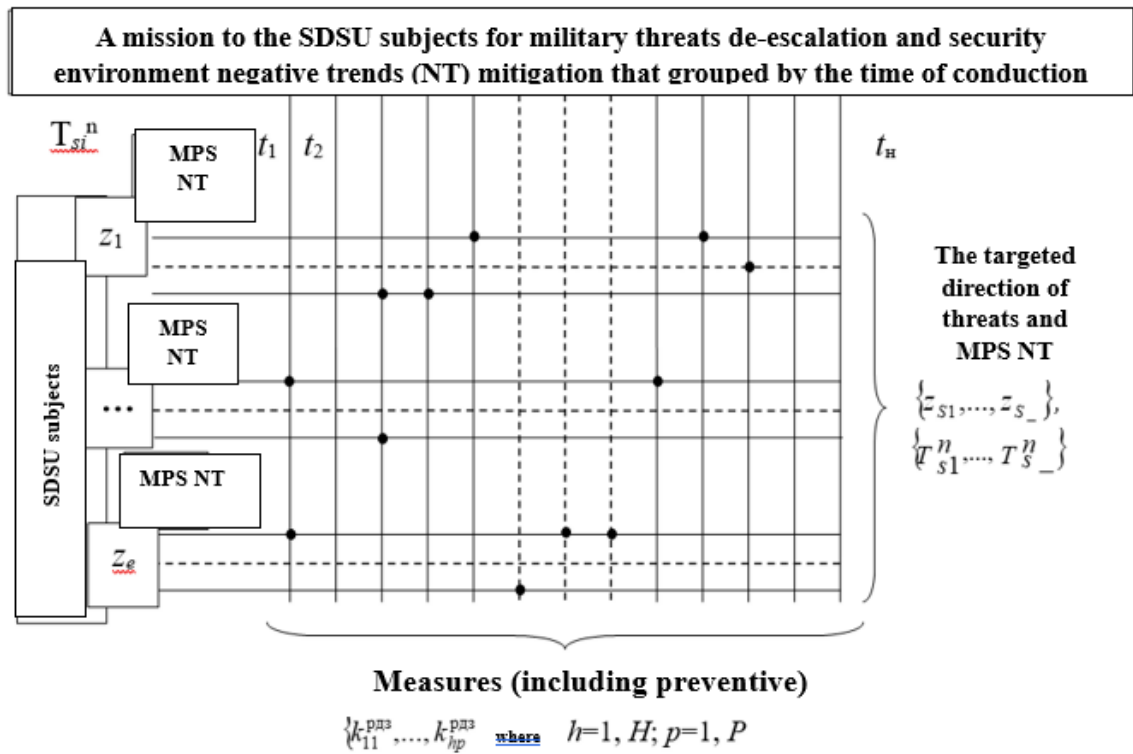


Fig. 2. Scheme of formalization of tasks for SBOU subjects in the process of de-escalation of military threats  $\{z_1, \dots, z_e\}$  and weakening the destructive impact of NT IDPs

In practice, a “threat de-escalation level” is required  $\Delta K_{h3c}(T_{np})$  can be assessed by experts using the automated decision support system (ADSS) “model M7” [5; 11-12] in an iterative manner by reducing the threat “weight” indicators  $z$  through the integrated use of military and non-military instruments of individual SBOU subjects (primarily of a non-military nature).

In our case, to formalize the tasks of the SBOU subjects, it is important to assess their necessary capabilities by solving the inverse problem using the DSS “model M7”. The required “threat de-escalation level” is assessed using the knowledge base of the expert system (ES) about threats (if one is created) and the DSS “model M7” [5; 11-12] in an iterative manner by reducing the “weight” (priority) indicators of threats on the Saati scale until the condition is reached:

$$\Delta K_{p\partial z}(T_{np}) = K_{\partial} \Delta K(t_1), \quad (2)$$

where  $K_{\partial}$  – de-escalation coefficient (takes fixed values: in the case of using non-violent means  $K_{\partial} = 1,1$ ; in case of use of force  $K_{\partial} = 1,2$  [10]);

$\Delta K(t_1)$  – change in the level of military danger as the difference between the received current level of military danger (threat) at the time  $t_1$  and threshold  $K_{np}$  (defined in the legal space of the state).

The required “level of threat de-escalation” can be achieved through various options ( $j=1, J$ ) involvement of forces and resources (within the capabilities  $x_s$ ) individual subjects  $S$ , which requires appropriate resources, the limitations of which should be taken into account when making the final decision.

Thus, the general hierarchy of the task of forming the required “level of threat de-escalation” in the course of countering a military threat and weakening the influence of the NT of the geopolitical and military-political situation will look like the one shown in Fig. 3.

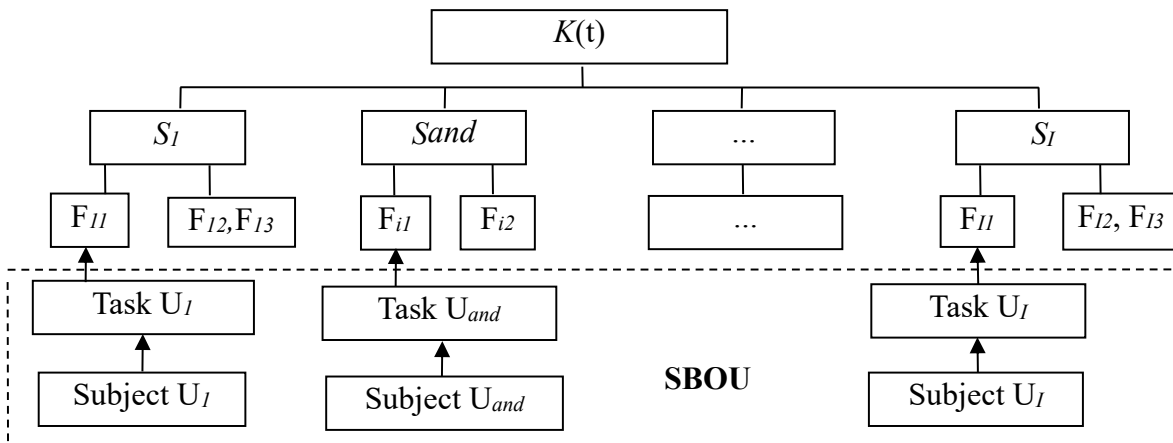


Fig. 3. Example of a hierarchy of tasks for forming the required level of threat de-escalation

It is at this stage of de-escalation that the problem of finding the most rational option for distributing tasks to SDSU subjects arises in terms of execution time, areas of relationships with manifestations of threat (contradictions) that are subject to influence (conflict-generating factors that need to be influenced) through sequential or simultaneous execution of tasks.

The formalization of tasks for SDSU subjects is facilitated by the completeness and objectivity of determining manifestations of threats (contradictions) in the spheres of relations between the opposing parties.

General hierarchy of the task of forming the desired reduction of destructive impact  $i$ -th NT security environment is shown in Fig. 4.

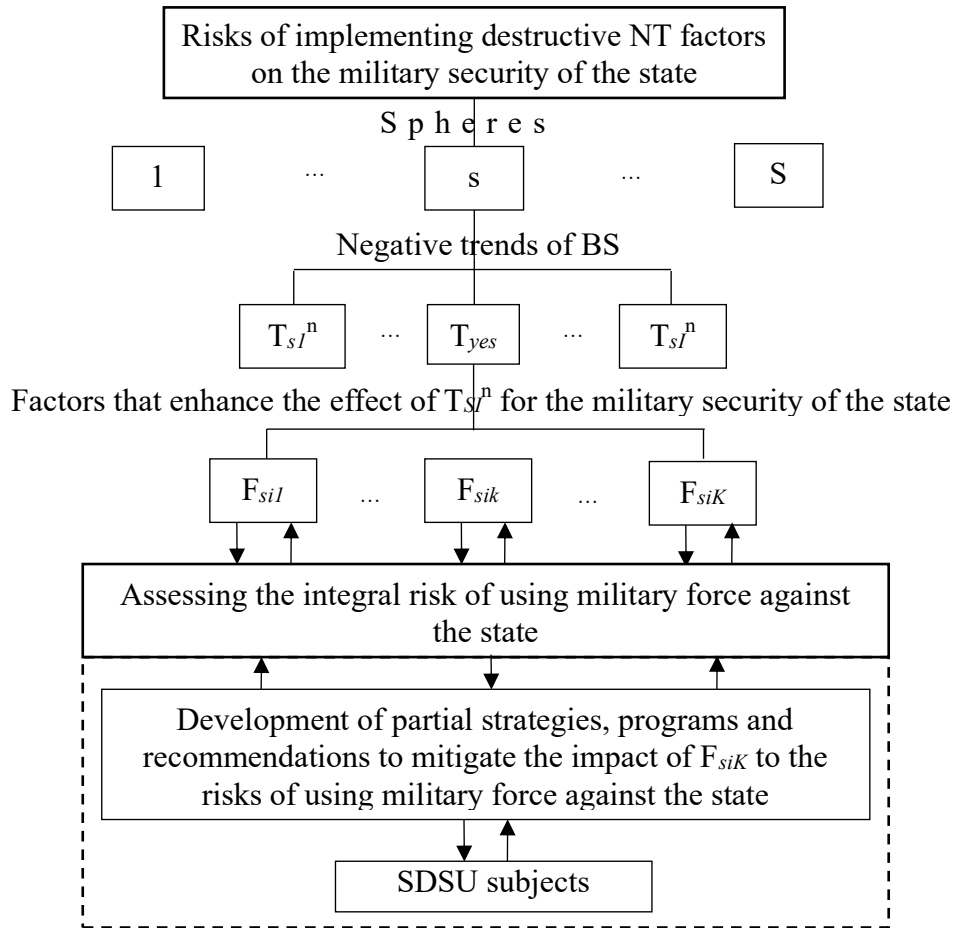


Fig. 4. Example of a hierarchy of the task of mitigating the impact of a negative BS trend on the risk of using military force against the state

The target function of reducing the impact of NT BS on the process of ensuring the military security of the state is based on limiting the risks of factors that have exceeded the critical level.  $K_{kpum}(t), \Sigma(R_{sik}(t) - K_{kpum}(t)) \rightarrow \min$ .

It is clear that at each stage of threat development, the results of the impact, their intensity, strength, “weight” will be different. That is why the distribution of tasks, ideally, should also be carried out at each stage of threat development (Fig. 1) taking into account the results of the influence of the SBOU on this development at the previous stage. This approach makes it possible to implement the above-listed requirements for the SDSU to ensure effective de-escalation of the threat and reduction of the impact of NT on the military security of the state, timely prioritization of non-military or military forces and means.

The determination and application of the forces and means of the SBOU entity when performing the assigned tasks is carried out according to the same logic as at higher levels of the hierarchy.

The neutralization task for a security and defense sector entity responsible for a specific area is, in quantitative terms, the necessary reduction in the impact of the proposed indicator, in other words, neutralization of its impact on the formation of the integral level of military danger by one or more gradations of the assessment scale (scale from 1 to 9), Table 1, or neutralization of its impact on the formation of the integral level of risk of the use of military force against the state, Table 1, Table 2.

However, this degree of formalization of tasks for SDSU subjects is insufficient for practical implementation, since it essentially determines only a strategy for countering threats of a military nature using non-violent and forceful methods and means.

Table 1

Table of neutralization tasks for SDSU subjects

Sphere (S=1, S)	“Weight” sphere S	The value of the indicator during the evaluation $z_s, (j=1, J)$	The value of indicators for expert formation of the required level of threat de- escalation $\Delta K_{sd}(T_{pr}), (j=1, J)$	Required impact reduction on a 9-point scale, (j=1, J)
S=1	$L_s$	$m_{s1}$	$m_{s1\partial}$	$m_{s1} - m_{s1\partial}$
		$m_{s2}$	$m_{s2\partial}$	$m_{s2} - m_{s2\partial}$
		$m_{sJ}$	$m_{sJ\partial}$	$m_{sJ} - m_{sJ\partial}$

Table 2

Table of neutralization tasks for SDSU subjects to reduce the risk of using military force against the state

Sphere (S=1, S)	“Weight” sphere S	The value of the indicators of the influence of Tsin BS factors on the level of risk	Current level of risk of use of military force against the state	The significance of risks for expert formation of the critical risk of the impact of NT on the state’s WB	The value of predicted risk indicators for forming the necessary mitigation of the impact of Tsn factors	Impact reduction required Tsin for 9-point scale
S=1	$L_s$	$m_{st1}$	$R_{sik}$	$r_{st1}^*$	$r_{stp1}^*$	$r_{st1}^* - r_{stp1}^*$
		...	...	...	...	...
		$m_{stk}$	...	$r_{stk}^*$	$r_{stk}^*$	$r_{stk}^* - r_{stp k}^*$

Each of  $E$  subjects of the state SDSU  $z_e (e=1, E)$  has  $b$  the functions it must perform –  $\{z_{e1}, \dots, z_{eb}\}$ . The mechanism for planning the implementation of tasks by each subject of the SDSU involves the development of a set of specific measures aimed at reducing the impact of the largest “weight” indicator. The number of measures, their combination and scale should be such as to reduce the impact of the specified indicator (for example, the intensity of the information influence of the opposing side on our troops (forces)) by one scale gradation (see Table 2).

## Conclusions

Thus, the developed version of the formalization of the threats de-escalating and reducing the impact of negative trends in the security environment task on the military security of the state makes it possible to substantiate two target functions for ensuring the military security of the state. One is to determine the necessary level of de-escalation of the identified threat, the second is to preventively reduce the impact of the NT of the geopolitical and military-political situation on the processes of ensuring the military security of the state based on limiting the risks of factors that have exceeded the critical risk level. In further publications, it is planned to carry out a mathematical description of the specified target function.



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