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WASHINGTON, D.C. 20505

18 April 1975

MEMORANDUM FOR: The Director of Central Intelligence

SUBJECT : MILITARY THOUGHT (USSR): Reconnaissance - Combat Functions for Reconnaissance

1. The enclosed Intelligence Information Special Report is part of a series now in preparation based on the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal "Military Thought". This article examines the problem of increasing the reliability of destruction of enemy nuclear means in terms of preemption probability. The author explores the possibility of creating reconnaissance-combat organs capable of delivering preemptive strikes and neutralizing enemy radio communications. This should be done by providing improved technical equipment and weapons rather than by adapting available means. This article appeared in Issue No. 2 (87) for 1969.

2. Because the source of this report is extremely sensitive, this document should be handled on a strict need-to-know basis within recipient agencies. For ease of reference, reports from this publication have been assigned

William E. Nelson
Deputy Director for Operations

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Summary:

The following report is a translation from Russian of an article which appeared in Issue No. 2 (87) for 1969 of the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal 'Military Thought". The author of this article Colonel V. Volobuyev. This article examines the problem of increasing the reliability of destruction of enemy nuclear means in terms of preemption probability. The author explores the possibility of creating reconnaissance-combat organs capable of delivering preemptive strikes and neutralizing enemy radio communications. This should be done by providing improved technical equipment and weapons rather than by adapting available means.

End of Summary

[redacted] Comment:

V. Volobuyev has made two other contributions to this publication. His article entitled "The Problem of Restoring Army Combat Effectiveness in an Offensive Operation" appeared in Issue No. 3 (79) for 1966; the other, "The Reconnaissance Independence of a Tank Army", was in Issue No. 2 (81) for 1967. The SECRET version of Military Thought was published three times annually and was distributed down to the level of division commander. It reportedly ceased publication at the end of 1970.

[redacted]

Reconnaissance - Combat Functions for Reconnaissance

by
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Under the conditions of modern combat operations, success in combat with enemy means of nuclear attack rests fundamentally on preempting him in the delivery of strikes. The preemptive destruction of these important targets is achieved by timely reconnaissance and a high degree of readiness of our means.

Examining the presently accepted methods of combat with operational-tactical nuclear means, we arrive at the conclusion that these methods do not always ensure the preemptive destruction of small, highly mobile, and carefully camouflaged nuclear strike means which can be readied for strikes within a short time.

One of the reasons for this is the unacceptably large amounts of time it takes reconnaissance data to get from the reconnaissance organs to the means of destruction. Let us look into this situation in greater detail.

The total time (T_Σ) expended in the preparation of a strike against enemy nuclear means is the sum of the time (t_{r1}) needed for the reconnaissance of the target and the transmission of the reconnaissance information (including getting the reconnaissance data to the fire means) and the time needed to prepare our fire means for a strike (t_{op}) against the target

$$T_\Sigma = t_{r1} + t_{op} . \qquad (1)$$

The results of special troop exercises and of research games conducted at the Military Academy of Armored Troops indicate that the greatest amount of time is spent in transmitting reconnaissance information through a multistage system of communications and processing. These expenditures of time often exceed, several times over, the time spent by the reconnaissance organ directly in detecting the enemy target and determining its

coordinates (t_r).

It is obvious that the time available to preempt the opening of fire by enemy nuclear means (Y) is equal to the difference

$$Y = t_{pr} - (t_{ri} + t_{op}), \qquad (2)$$

where t_{pr} is the time remaining at the disposal of the enemy for preparing this means to open fire or to deliver a strike, from the moment the means is detected by our reconnaissance.

A similar relationship can be expressed in a nomogram of preemption time (sketch 1).

To determine preemption time from the nomogram, it is necessary to find, on scale t_{op}, the number designating the time to be spent in organizing the fire strike, connect it with the number on scale t_{ri}, designating the time needed for reconnaissance and information, and extend this line until it intersects with the scale of total time t_{riop}. The point thus obtained is connected on scale t_{pr} with the number characterizing the degree of readiness of the enemy nuclear means to deliver a strike, and the preemption time is read off in minutes on scale Y. In the first two examples shown on the nomogram, our means preempt the enemy by 10 and 20 minutes respectively; in the third example, the enemy preempts us by 30 minutes.

In actual practice it is also necessary to solve such problems in reverse, for example, to determine the time which can be allotted to reconnaissance in relation to the degree of readiness of enemy nuclear means and of our fire means to mount a strike when there is a set (in connection with operational-tactical considerations) preemption time (the fourth line on the nomogram). In this case, we connect the point designating the time for the preparation of enemy means (in our example, 25 minutes) on scale t_{pr} with the point designating the set preemption (5 minutes) on scale Y, and we extend a straight line to the intersection with scale t_{riop}. From the point obtained (20 minutes), we draw a straight line to the point designating the readiness of our means of destruction on scale t_{op} (40 minutes). The intersection of this line with scale t_{ri} will show the time for reconnaissance and information, minus 20 minutes in this example, i.e., the conduct of reconnaissance is already useless.

A comparative analysis of the characteristics of the time of readiness of our own and enemy nuclear means and of the time needed by reconnaissance

organs shows that the probability of preemption is extremely slight in 50 percent of the cases. Moreover, if the degree of readiness of the enemy nuclear means is equal to or greater than our own, then in order to preempt the enemy our reconnaissance data must be obtained before the enemy starts to prepare this means for a strike (fourth example in the nomogram).

An objective evaluation of the situations set forth above urgently demands an improvement in the methods and in the search for new ways to increase the reliability of destruction of enemy nuclear means. Let us examine to what degree and in what way reliability can be increased in relation to the probability of preemption and the timeliness in the delivery of our strike.

The preemption probability (V_y) is expressed by the following mathematical equation:

$$V_u = 1 - \frac{t_{ri} + t_{op}}{t_{pr}} . \qquad (3)$$

An analysis of this formula shows that the probability of preempting the enemy is in linear relation to the time expended by our means on reconnaissance and information (t_{ri}), and on the organization of the strike (t_{op}). The probability changes, however, according to the hyperbolic law, in connection with the change in the enemy time of preparation for a strike (t_{pr}), which can be clearly seen on the graph of preemption probability (sketch 2).

It follows from the graph that in order to increase the probability of preemption it is necessary to sharply reduce the time spent by our means on reconnaissance and information (t_{ri}) and on the organization of our strike (t_{op}). At the same time, we cannot assume that the process of improvement in enemy nuclear means (in the sense of reducing t_{pr}) will cease. As the value of the quantity $\frac{t_{op}}{t_{pr}}$, which characterizes the relative achievements of the two sides in reducing the time for organizing a strike, tends to approach unity, the preemption probability will drop sharply and, consequently, the reliability of destruction will be lowered.

In theoretical research studies, in military literature, and in lectures at military-scientific conferences it is frequently reported that we must increase our reconnaissance forces and means considerably in order to obtain reconnaissance data on a timely basis. We can agree with the authors of such statements if we are discussing the least necessary, rational increase enabling units, large units, and formations to handle their reconnaissance independently. In addition, no amount of increase in

reconnaissance forces and means, no matter how great, can solve the problem of reconnaissance timeliness it combat with nuclear weapons is conducted using old methods.

Furthermore, an excessive increase in the number of reconnaissance organs can lead to an overburdening of the troops and to complications in servicing, supporting, and supplying them. But above all -- it will be impossible to avoid even greater expenditures of time in obtaining and processing the increased flow of information. The information will lose its reconnaissance value because of the delay in processing, and this will have an adverse effect on the reliability of our destruction of enemy nuclear targets.

From the foregoing it is evident that the traditionally developed method of combat with conventional enemy targets according to the pattern -- reconnaissance, transmittal of information to the commander, evaluation of the reconnaissance data by the commander, transmittal of commands to the means of destruction, and the destruction of the target -- does not always ensure the delivery of strikes against the small, carefully camouflaged, and highly mobile enemy means of nuclear attack. Therefore, in seeking new methods of destroying these means, it is obvious that we must, if necessary, abandon the established pattern of organizing combat. It appears to us that we should also not confine ourselves to the ingrained view regarding the functions of reconnaissance, which have supposedly always comprised only the detection of the enemy and the transmittal of data on the enemy to the commander.

The patterns in the development of reconnaissance, confirmed by the experience of World War II, by postwar training exercises, and by theoretical research studies, permit the observation that for objective reasons reconnaissance is changing more and more from a form of combat support to an integral part of the combat activity of troops; this is furthered by the technical and fire equipping of field reconnaissance organs.

This leads us to the idea of the possibility and expediency of using a considerable portion of our operational-tactical reconnaissance organs for combat with enemy nuclear means. Operating, as a rule, in close contact with the enemy and inside his positions, these organs can often deliver preemptive strikes and put out of action important targets which they have detected. Under such conditions it is advisable and even necessary for these reconnaissance organs themselves to conduct combat against enemy nuclear means according to the following pattern: the detection of the

nuclear means and its immediate destruction. All of this considerably increases the capabilities of troops to destroy enemy nuclear weapons in a short period of time.

In studying the problem of reconnaissance - combat activity we have become convinced that it can be resolved successfully by further equipping reconnaissance organs, special groups and teams, and deep reconnaissance groups from combined-arms large units with modern reconnaissance and communications equipment (accurate rangefinders, instruments for identifying nuclear warheads from a distance, radio sets with rapid operation and automatic coding and decoding of transmissions), and with appropriate armament and combat equipment. If this is done, we believe that a systematic development of the newest means and their introduction into reconnaissance units and subunits will lead to the emergence of different operating methods and organizational forms in reconnaissance organs and, in the final analysis, to the creation of reconnaissance-combat organs.*

The time has now arrived when we must devote attention to increasing the reconnaissance-combat functions or the neutralization functions, which are becoming characteristic of reconnaissance elements and of individual types of technical reconnaissance means.

Considering the tendencies toward the increased mobility of enemy means of nuclear attack and toward the reduction of the time needed to prepare them for a strike, reconnaissance organs, in order to reach highly mobile targets, in the future will have to be able to maneuver at an ever increasing pace. One of the ways of achieving a significant gain in time in the transfer of reconnaissance efforts along axes and in the depth is to airlift reconnaissance organs by helicopter.

To destroy or put out of action nuclear warhead delivery means and the means for controlling units which employ nuclear weapons, and to disrupt the enemy delivery of nuclear warheads and to restrict his moving of them, it is advisable to equip our special and deep reconnaissance subunits with guided missile launchers, magnetic mines, and silent small arms.

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*Here and below, the term reconnaissance-combat organs is to be understood as those personnel and combat means, of reconnaissance units and subunits, capable of destroying enemy nuclear weapons immmdiately after they are detected.

It is already possible to increase the capabilities of large units and operational formations to conduct deep and special reconnaissance with relatively small materiel outlays by a judicious increase in the number of organic deep and special reconnaissance groups. In our opinion, it is also possible, without additional expenditures of materiel means, to centralize the control of radio reconnaissance units and radio countermeasures units. This will enable us to make more economical use of radio reconnaissance means and, at the same time, to increase the capabilities of detecting the enemy communications means. There will also be an improvement in the resolution of problems of the simultaneous deployment of OSNAZ subunits and SPETSNAZ subunits without mutual jamming, as well as an improvement in the quality of the processing of reconnaissance data.

However, the main advantage of centralizing control is the capability it affords to neutralize the radio communications of control posts of enemy nuclear means on a more timely and flexible basis, depending on the reconnaissance value and importance of the radio means detected. In other words, centralization of control of the means of radio reconnaissance and radio countermeasures is the most expedient method for combat with nuclear weapons according to the pattern: radio reconnaissance -- radio countermeasures.

It has been noted above that the degree of probability of a timely strike is significantly (if not decisively!) influenced by the time spent on the transmittal of information from a reconnaissance organ to the means of destruction. Let us assume that this time is reduced to near zero through the use of, let us say, television, enabling the means of destruction to receive reconnaissance data on an enemy target at the same time that an event takes place (at the time this target comes into the field of view of the reconnaissance organ). In this case, the preemption time for delivering a strike will be determined by the difference in time required by the means of destruction of the two sides for delivering their strikes.

If the degree of readiness of the means of the two sides is equal, and, even more so, if the degree of readiness of an enemy nuclear means is greater, a preemptive strike against the latter is possible only if the reconnaissance organ detecting it can deliver the strike itself. The probability of such a strike is determined by the following equation:

$$V_{ur} = \frac{t_{pr} - t_r}{t_{pr}}, \qquad (4)$$

while the degree of probability is characterized by curve 3 (see sketch 2).

It is important to note one further circumstance: in this case, the degree of probability of making a timely strike will be very close to the degree of reliability of destruction, since a certain amount of inaccuracy in reconnaissance data, unavoidable under the former method of destruction, will not result in diminished reliability. For example, the probability of a timely strike against an enemy nuclear means which is in a state of 60-minute readiness, by a fire means of ours at the same degree of readiness, is equal to zero (point A on sketch 2). But the probability of a timely strike and the reliability of destruction by a reconnaissance organ, which spent 10 minutes on the detection of this target and in the preparation of its own weapon, will be 85 percent (point B on sketch 2). This is a sufficiently high reliability.

These calculations and examples once again offer convincing testimony as to the advisability of expanding the reconnaissance-combat functions or neutralization functions which will be carried out by reconnaissance organs right up to the time they become reconnaissance-combat organs.

It appears to us that it is advisable to resolve the problem of creating reconnaissance-combat organs not by adapting available means, since it is a question here of a fundamentally new method of combat with enemy means of nuclear attack, but by attaining a high level of technical and fire equipping of these systems. At the same time this will lead to a reduction in the personnel needed for a piece of reconnaissance-combat equipment. Specific recommendations on this problem can be made only on the basis of subsequent careful research studies, innovations, and practical testing.

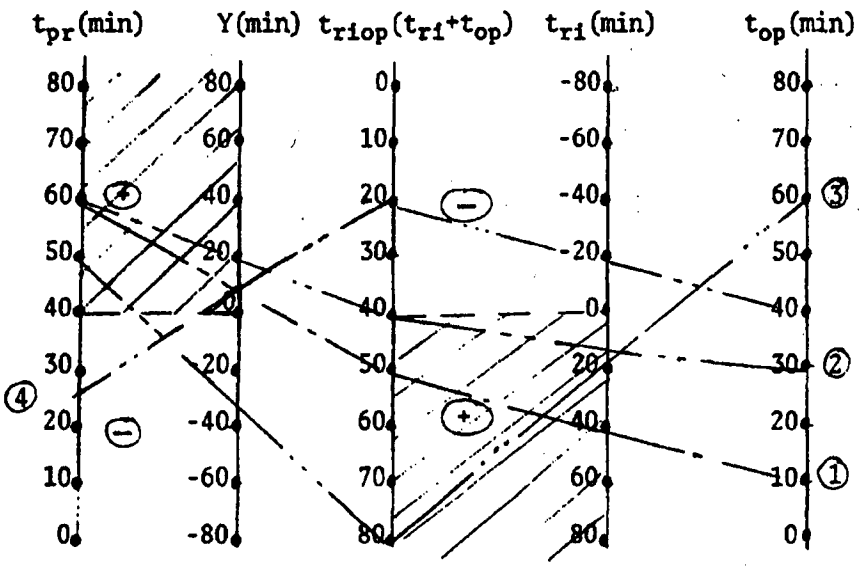
It is apparent that broad possibilities for creating silent weapons for reconnaissance-combat organs are opened by laser equipment, small-size guided grenades, and mortars using new types of explosives and incendiary means. At the present time, it is possible to make only a preliminary and purely approximate estimate of the required number of such organs, bearing in mind that their use must not diminish the reconnaissance capabilities of the troops. In our view, the number of reconnaissance-combat organs must correspond to the number of batteries of nuclear means in the opposing enemy grouping if the latter are in the field of view of these reconnaissance-combat organs.

Let us make an estimate. In a large unit of our probable enemy, which we can expect to be opposing a division of ours, there are 12 to 16 batteries of means for delivering nuclear warheads to a target. These means can maneuver within the zone of operations of their large unit to a

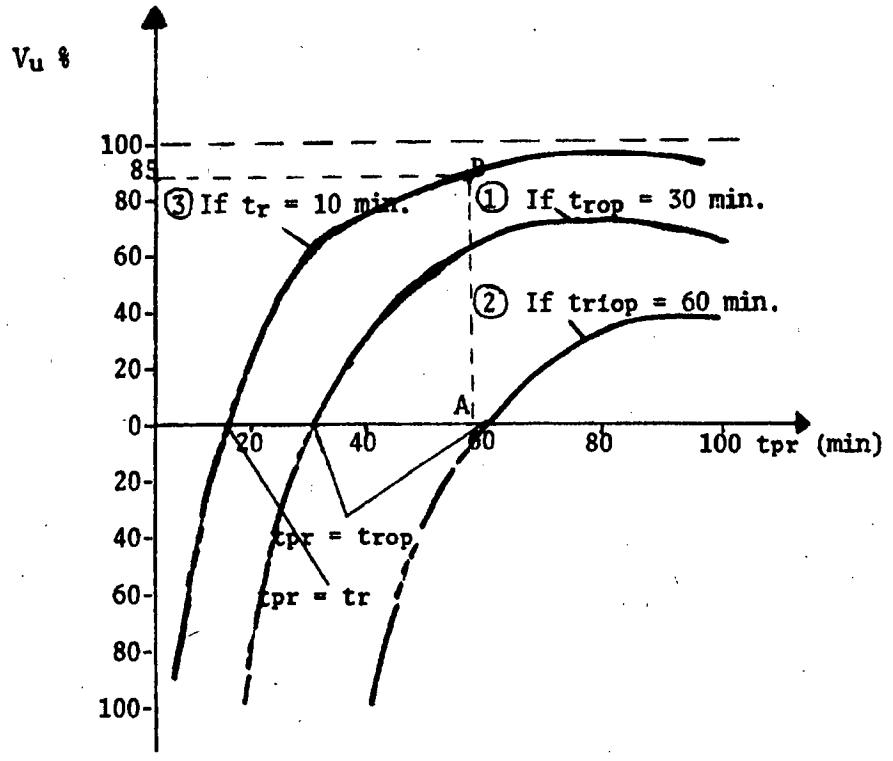
depth of 30 to 50 kilometers along 4 to 5 axial and 2 to 3 lateral roads, forming 8 to 15 road junctions. The presence of a reconnaissance-combat organ in the area of each such junction virtually excludes undetected maneuvering by these enemy nuclear means. Proceeding from these considerations, an average of 10 to 15 reconnaissance-combat organs will be required per division, which comprises 40 to 60 percent of the total number of ground reconnaissance organs available at the present time.

In conclusion, let us point out that allocating tasks for reconnaissance forces and means in regard to combat with enemy means of nuclear destruction, particularly with those of operational-tactical designation, and adding reconnaissance-combat functions to some of them, may be regarded as a supplementary measure to the established system of destroying enemy nuclear means with conventional fire means and, mainly, nuclear means.

Along with this, the creation and effective utilization of reconnaissance-combat organs will to a great extent further the resolution of the problem of combat with enemy nuclear weapons, especially when the two opposing sides are at an equal degree of readiness to deliver nuclear strikes.



Sketch 1. Nomogram of preemption time



Sketch 2. Graph of preemption probability