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22 November 1976

MEMORANDUM FOR: The Director of Central Intelligence

FROM : William W. Wells
Deputy Director for Operations

SUBJECT : MILITARY THOUGHT (USSR): The Role and Control of Missile Units in the Ground Forces

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 various views on how rocket troops should be employed and controlled in an attempt to better define their capabilities and role in combat actions. The author concludes that tactical missile units, with their more powerful nuclear weapons, must be held distinct from artillery and must be considered the basis for combined-arms operations. He examines both sides of the question as to whether the combined-arms or rocket troops and artillery staff is in the better position to control the missile units, asserting a need for clearer delimitation of functions between the two with the combined-arms commander having overall authority. This article appeared in Issue No. 4 (65) for 1962. [redacted]

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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 [redacted]

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William W. Wells

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Intelligence Information Special Report

COUNTRY USSR

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SUBJECT

MILITARY THOUGHT (USSR): The Role and Control of Missile Units in the Ground Forces

SOURCE Documentary

Summary:

The following report is a translation from Russian of an article which appeared in Issue No. 4 (65) for 1962 of the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal "Military Thought". The author of this article is Colonel General of Artillery N. Fomin. This article examines various views on how rocket troops should be employed and controlled in an attempt to better define their capabilities and role in combat actions. The author concludes that tactical missile units, with their more powerful nuclear weapons, must be held distinct from artillery and must be considered the basis for combined-arms operations. He examines both sides of the question as to whether the combined-arms or rocket troops and artillery staff is in the better position to control the missile units, asserting a need for clearer delimitation of functions between the two with the combined-arms commander having overall authority. Other topics touched upon include the need to shorten the time required for reconnaissance and assignment of targets, and to retain the brigade headquarters in the chain of command.

End of Summary

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[redacted] Comment:

[redacted] The author, now retired, has written articles concerning the importance of artillery in modern warfare for other publications.

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The Role and Control of Missile Units in the Ground Forces

by

Colonel General of Artillery N. Fomin

In spite of the enormous attention which has been paid in recent years to questions of the theory and practice of the combat employment of rocket troops, so far one observes quite contradictory views on their role and place in the ground forces. Everyone acknowledges the effect of rocket troops on the methods and forms of conducting a battle and operation and on their end result; however, the extent of this effect is appraised variously. If, in respect to the strategic rocket forces, everyone agrees that their strikes are able to decide the outcome of a war, operational-tactical and especially tactical missiles are often assigned the overly modest role of an, albeit extraordinarily powerful, nonetheless auxiliary means. Many believe that the strikes of the army and front missile brigades -- even massed strikes and those directed at the destruction of the main enemy grouping -- in the final analysis only support the accomplishment of tasks, only create favorable conditions for the actions of troops.

The leading role of missile/nuclear strikes is formally acknowledged and the working out of a combined-arms decision begins with them; however, time and again, the main thing in the concept is considered to be the selection of axes of the actions of the armies and divisions and the correct drawing of the arrows designating these axes. It is enough to take a look at many of our operations plan maps to be convinced of this: among the arrows piercing through the whole operational disposition of the enemy and his territory we often have difficulty finding the targets to be subjected to missile/nuclear strikes, which, in addition, are scattered over enormous spaces. We are not even mentioning the cases of separately representing the use of nuclear means and the actions of ground forces on different maps -- here, as it were, not only is the leading role of nuclear strikes graphically denied, but the very organic connection of nuclear strikes and troop actions is even torn apart.

There are very definite opinions about the auxiliary role of tactical missiles. Such a point of view was asserted, for

instance, in the main report at a conference in one of our leading academies, where tactical missile units were regarded not as the main means in the hands of the command, but as a means supporting the actions of divisions.

Along with this, a considerable number of comrades, although they do not belittle the role and importance of rocket troops, regard them as a distinctive kind of artillery -- with brand new qualities, it is true -- to which all the fundamental doctrines proper to classical artillery are supposedly applicable. They try to resolve nearly all the questions of the organization and control of rocket troops by analogy with artillery. These views were reflected, in particular, in the proposal to establish missile corps, which resurrects the unjustified idea of artillery corps, or in the demand -- again by analogy with artillery -- to give rocket troops their own means of reconnaissance without taking into consideration that these troops do not have the right to act upon the reconnaissance data, i.e., to independently select a target and independently open fire.

Underlying these and other views on the role and importance of rocket troops, in our opinion, is chiefly an underestimation of the power of nuclear means. Even for one who has seen the effect of one actual nuclear burst it is still not easy to imagine the whole enormous picture of desolation from a massed nuclear strike. It is all the more difficult to do this on the basis of those simulated "nuclear" bursts, immeasurably removed from reality, which we carry out in exercises, where the troops of the sides often safely continue to operate in spite of the losses inflicted on them by "nuclear strikes".

In the final analysis, both those who blindly copy the methods of employing rocket troops from artillery and those who see the actions of the ground forces large units, instead of nuclear strikes, as the basis of every decision, and consequently consider rocket troops a means or even a branch arm that merely establishes favorable conditions for the successful development of an operation, are essentially placing rocket troops on a level with artillery.

Finally, it should be said that, although most of our commanders correctly understand the role and place of rocket troops, many of them, however, in our opinion, draw incorrect

conclusions in the area of their actual employment in a battle and operation.

The chief merit of missiles, by virtue of which they are rapidly developing and forcing such long-tried means as aviation and artillery to make room, as is known, is their capability for delivering a nuclear warhead to virtually any distance. The increase in range by tens and hundreds of times and in the yield of a strike by millions of times in comparison with artillery has caused missiles to occupy the first place in the system of fire means of the ground forces. Rocket troops are the main force in the hands of a combined-arms command through which it endeavors to accomplish the main part of the tasks confronting it. Missile/nuclear means are superior to the capabilities of combined-arms large units for destroying an enemy (a whole unit of fire of artillery shells of a motorized rifle division destroys sheltered personnel in an area less than half that of one 20-kiloton tactical missile); therefore, a combined-arms commander cannot turn their use over to anyone.

The rocket troops, being the ground forces' main means of delivering nuclear warheads, to a considerable degree determine the actions of these forces and, as it were, set the tone of the whole operation. Their strikes constitute the basis of the combined-arms decision for the operation. These strikes, as it were, lead the ground forces large units along after them. It is not the axes of ground forces actions that determine the strikes of the rocket troops but, on the contrary, the series of missile/nuclear strikes that determines the axes of movement of the troops who exploit their results.

Tactical missiles are no exception in this respect, as some comrades think; after all, for a division in the zone of its actions the nuclear strikes of tactical missiles with yields of 10 to 20 kilotons each have the same importance as the strikes of operational-tactical missiles do for an army. The actions of divisions and the success of their advance (or defense) are determined by correctly delivered nuclear strikes independently of to whom these strikes belong or by whom they are delivered -- the army or the division itself. The commander of an army will carefully consider how and where to deliver missile/nuclear strikes and then direct the actions of his army for the purpose of best exploiting their results. Every division commander will

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approach the solution of the question of using his missile/nuclear means in exactly the same way. He will also hit the most important targets with them and exploit the results of his own nuclear strikes. Therefore, not assigning tasks to operational-tactical missiles in the form of "support", "assistance", etc., neither should we do this in respect to the missile means of divisions. Nuclear weapons will not cease to be nuclear weapons, no matter whose hands they are in or how few they are.

In striving to assign rocket troops a place corresponding to their capabilities we are far from having any idea of exalting them beyond measure and transforming them into a universal means meant to accomplish all tasks. Such means do not exist, and success is achieved only by the joint efforts of all branch arms and branches of the armed forces on the basis of properly executed cooperation among them. However, this achievement is not possible without a clarification of the characteristics and capabilities, of the role and importance of each of the branches and branch arms.

Having a negative effect on the development of correct views on the role and place of rocket troops was the regulation definition of rocket troops as missile artillery, as a result of which many provisions, including terminology, began to be automatically carried over from the area of artillery to the area of missiles. And this, in turn, introduced no little confusion into the employment of rocket troops. We propose discarding the term "missile artillery" as incorrect.

Of course, it is not by accident that missiles, the youngest type of weapon, happened to be combined in the same hands with artillery, that very ancient type of armament. Although there is a great difference between them, the basic combat characteristic of both is fire. It is also perfectly obvious that all fire tasks cannot be accomplished by missiles; many of them must be performed by the fire of artillery, which is now consequently called upon to assist missile units. In addition, missiles will by no means always dominate in this or that battle and engagement -- in these cases artillery must, though to a feeble degree, replace the action of tactical missiles.

Thus, missiles and artillery have been bound by firm bonds, with artillery, which was once called the "god of war", having now become, as it were, the assistant and deputy of missiles. In this unequal union, the roles are distributed such that the more tasks missiles accomplish, the less, generally speaking, artillery is required. This dependence of missiles and artillery can best be exploited, naturally, by one chief, who is the chief of rocket troops and artillery.

To note a dependence does not transform rocket troops into artillery nor change their status. If artillery, whose tasks stem entirely from the tasks of the ground forces large units and are completely subordinate to them, may in this sense be called the servant of the ground forces, then missiles necessarily play, as has already been said, a leading role since their tasks constitute the basis of the combined-arms decision.

Artillery, being a sort of servant of the ground forces, is even more dependent on missiles, since it hits those targets (of the number supposed to be hit, of course) which have been left untouched by missiles.

The role of missiles and artillery does not change even in those cases where the greater part of fire tasks are accomplished by artillery means and where it would appear the role of artillery prevails. No matter how few missiles there are, the idea would never come into anyone's head to first determine the fire tasks of artillery and then turn over the rest of the tasks to the missile/nuclear means.

All that has been said inevitably leads us to the conclusion that rocket troops are not artillery, that operational-tactical missile large units and units are a completely new, and the most powerful, branch arm of the ground forces, capable, by virtue of its unprecedented strength, of accomplishing the main part of the tasks confronting the troops. The employment of this branch arm underlies every combined-arms decision, forming its core, and is therefore the personal prerogative of the combined-arms commander.

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The different understanding of the role and place of rocket troops, which was spoken of above, naturally also leads to differences in the area of their practical employment. Moreover, this can be seen in the control of rocket troops, some questions of which we intend to dwell on, without touching on all aspects of it.

In conformity with the viewpoints examined on the role and place of rocket troops, we can observe in the area of their control two basic and, to a certain degree, contradictory tendencies and one, as it were, intermediate one.

Underlying one of the tendencies is, undoubtedly, the correct view of rocket troops as the main destructive means in the hands of the combined-arms command. This is the tendency toward maximum concentration of the functions of control of rocket troops and their fire in the hands of the combined-arms commander and, by the same token, toward the inevitable diminishing of the role of the chief of the rocket troops and his staff in this matter and their transformation into technical executors supporting the decision.

The second tendency, to a considerable extent determined by the view of rocket troops as a sort of artillery, wherein many methods and rules of control of artillery are mechanically carried over to the rocket troops, consists in the endeavor to preserve for the chief of rocket troops and his staff the functions which belong to them in the area of the use of artillery.

And, finally, the "intermediate" tendency is expressed in the voluntary transfer on the part of the combined-arms commander of all the functions of fire control to the chief of the rocket troops, which took place, for instance, in the command-staff exercise in the Group of Soviet Forces, Germany in May 1961, where the chief of the rocket troops and artillery was assigned only so-called "operational tasks".

The first two tendencies, especially the second, had their effect on, for instance, the exercise in the Carpathian Military District in July of last year, where, on the one side, "...the matter reached the point that targets for the delivery of nuclear strikes which had to be hit by army means were determined not by

the commander of the army, but by the chief of rocket troops and artillery of the front and transmitted to the army by his staff directly to the staff of the rocket troops and artillery of the army" (from the presentation at the critique by Marshal of the Soviet Union, Comrade V. I. Chuykov). The army commanders often did not know that their subordinates were delivering nuclear strikes. On the other side, we see in the same place the removal from the authority of the chief of rocket troops and artillery of even such a technical function as computation of the coordinates of the aiming points.

A study of these tendencies shows that the correct solution of the questions of fire control of the rocket troops lies primarily in the area of a rational distribution of the functions of control among the various command levels. In practice, we usually have different variants of this distribution. We believe that, without a solution of this question, without a precise distribution of the responsibility, rights, and duties of each level, the normal control of troops in general, and more so of the fire of rocket troops, is impossible.

Above all, it is necessary for everyone to agree that rocket troops, as has already been said, are not artillery, that, by virtue of the very great effect of their strikes -- even with the launch of one nuclear missile -- they have to participate in the accomplishment of the main task; therefore their employment, which is in no way "supporting", cannot be transferred to the authority of anyone else, and that means that not one nuclear missile can be launched without the decision of the combined-arms commander. Here one cannot fail to see the enormous fundamental difference from artillery, where it is reprehensible not only for the chief of artillery, but even for the commander of an artillery battery not to open fire independently on an advantageous target. Those chiefs of rocket troops and artillery who try to control the fire of rocket troops in exactly the same way and on the same principles as artillery fire are absolutely wrong.

Fire control, as is known, begins with reconnaissance and the assignment of tasks. And if in respect to artillery we often consider this "beginning" to be the moment when reconnaissance data are received in the artillery staff and the ensuing decision of the artillery chief to hit the target, then the "beginning" of

the fire control of the rocket troops should be considered the moment when reconnaissance data are received in the combined-arms staff and the decision is made by the combined-arms commander to employ a nuclear missile.

It does not, of course, follow from what has been said that the chief of rocket troops and artillery must be deprived of all creative functions and converted into some sort of relay level for the decisions of the formation commander. Going in this direction, one might easily come to the idea of also abolishing the staffs of the rocket troops and artillery. After all, if the formation commander must himself indicate to the chief of rocket troops and artillery the coordinates of the target, the yield of the warhead of the missile, and other data, and he can do this only with the help of his staff (for he will not have time for all these calculations), then it is natural that either the combined-arms staff must have its own T/O specialists, or those persons who work on these matters in the staff of the rocket troops and artillery will have to be transferred at least temporarily to the combined-arms staff. And this is the abolition of staffs of rocket troops and artillery as such. It is therefore not by chance that statements are appearing (for instance in the Collection of Articles of the Journal "Military Thought", No. 4 (59) for 1961) which propose to eliminate them.

Considering such proposals an extreme, and explaining them by an inadequate representation of the content and volume of work of artillery staffs, we think that the delimitation of functions of the staffs must be done in such a way that not one principally combined-arms function is infringed upon and that the role of the chief of rocket troops and artillery and his staff are not reduced to a level that makes the desirability of their existence dubious.

Thus, we consider it unwarranted to endeavor to force the combined-arms commander (even with the assistance of his staff) to indicate the coordinates of a target to be destroyed. In actual fact, to a combined-arms commander making a decision for a missile/nuclear strike, it is important not what coordinates it is delivered upon, but that precisely the target assigned be destroyed; even the yield of the warhead is not important, but getting the necessary degree of destruction of the target is -- which, as is known, in itself already determines the yield

required. The question arises, what if an error has slipped into the coordinates received -- who will bear the responsibility for the miss? If the subordinate is going to check his commander and make corrections in the figures received or doubt them altogether, then this will not facilitate, but hinder, fire control.

In our opinion, the chief of rocket troops and artillery in all cases of the delivery of a missile/nuclear strike must receive from his commander the following data: the strike target and the required degree of its destruction, the permissible number of missiles to use (not necessarily with an indication of their yield), the type of bursts, and the time of delivery of the strikes. All the remaining data are obtained in the staff of the rocket troops and artillery by means of calculations and are acted upon, of course, after approval by the formation commander. When the question is resolved in this way there is no violation of the prerogatives of the formation commander, the combined-arms staff is not burdened with jobs that do not much pertain to it, and at the same time, the chief of rocket troops and artillery and his staff are not deprived of their inherent functions and necessary responsibility. And control as a whole is built upon a more precise foundation.

Of course, it is necessary to resolutely overcome the tendency to do everything only through one's "own" (combined-arms) staff on the basis of the current conviction that it "must know all" and be "posted" on every single thing. This leads not only to a detrimental duplication of work and to impersonality and lack of responsibility, but also to an excessive overloading of the combined-arms staff. This last will inevitably entail an enlargement of its T/O, which in no way agrees with present requirements to have small but efficient control organs.

Having no opportunity to examine the delimitation of all the contiguous functions of combined-arms and artillery staffs, we should like to turn our attention to only one of the questions of planning. In a report at one of the science conferences, for instance, the demand was put forth to transfer the planning of the relocation of rocket troops to the combined-arms staff. The reason for this demand was the necessity of considering the nature of tasks and time limits for fulfilling them by the

troops, their rates of advance, the range of fire of the missiles and other capabilities of the rocket troops, and also the specific features of the theater and "other operational factors". It was considered that all this can be done only by the combined-arms staff.

The question arises, why can the staff of rocket troops and artillery not take all this into account? Is it possible that, in planning the employment of rocket troops and artillery, it will not be aware of the nature and time limits for fulfilment of tasks by the troops? Is it possible that it knows less well than the combined-arms staff the range and capabilities of the rocket troops? Who, if not the staff of the rocket troops, is to best know the position and status of the rocket troops and best calculate the distance of the moves or leapfrogs for the relocation of any of the battalions in the brigades? Who, if not the staff of the rocket troops, can most easily coordinate with all this the reconnaissance of routes and positions and the timely topogeodetic and other types of preparation of the rocket troops?

One of the main requirements for the relocation of rocket troops must be to ensure the constant readiness of the batteries on alert. The question is, how will the combined-arms staff be able to take this requirement into account if all the work of the batteries on alert is planned and organized by the chief of rocket troops and his staff?

As one can see, the reasons for the proposal being examined are clearly unconvincing. Here we have a definite manifestation of the tendency to gather everything into the combined-arms staff, regardless of whether this is necessary or not.

Finally, one more question -- what fundamental points are there in the calculations for the relocation of rocket troops which would force a combined-arms staff, overloaded even without this, to involve itself with them? After all, what is important is not that the relocation begins when the distance is settled -- and this is known not only to the combined-arms staff, but also to every commander of a missile launcher -- what is important is something else: that, when the troops reach their areas the rocket troops be ready in a certain strength for the delivery of strikes. It is precisely this that must be required of the staff

of the rocket troops and artillery, and it is precisely in this that the whole substance determining the relocation of rocket troops lies.

We believe that the relocation of rocket troops must be planned by the chief of rocket troops and artillery and his staff, with the closest coordination of all questions with the operations directorate or department of the staff of the front or army.

We would especially like to emphasize the intolerability of having command of missile units which bypasses the appropriate army or division commander, which took place in the above-mentioned exercise in the Carpathian Military District. With such a practice, one cannot demand full responsibility of the bypassed army or division commanders for the successful accomplishment of the tasks confronting them, and they are altogether deprived of the independence absolutely necessary under present conditions, as well as of confidence in the success of their planned methods of actions, since at any time and utterly unexpectedly their main weapon may be employed contrary to their concept.

The allocation of the missile means of lower command levels to the preparation and delivery of massed strikes must be done through the commanders of these levels, i.e., through the corresponding army and division commanders. As is known, the proponents of controlling the fire of rocket troops the same way as artillery fire object to this. By way of an argument for having to go over the head of the army commander (or the appropriate division commander) in individual cases, they usually cite the necessity of gaining time. However, this is unconvincing, since massed strikes with the allocation of the means of lower levels are delivered relatively rarely and in most cases, taking into consideration the dimensions and nature of the targets, plenty of time is allotted to their preparation. Besides that, there is still by no means any certainty that the transmission by the front commander of his instruction to the army missile brigade through the army commander and not through his own chief of rocket troops, and hence the simultaneous preparation of the strike at the front and army levels, will take more time than the transmission of the same instruction to the army through his own chief of rocket troops with "centralized"

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preparation of the strike in the headquarters of the latter. In both cases, to reach the chief of rocket troops of the army, the instruction must pass through one level -- through the army commander in the one case, and in the other -- through the chief of rocket troops of the front (bypassing the army commander). The communications of the front commander with the army commander are undoubtedly better than those of the chief of rocket troops of the front with the chief of rocket troops of the army, and one can hardly doubt that they will operate faster in the first case.

As for shortening the time expended in the fire control process, it is not enough to consider it only within the framework of the activity of the chief of rocket troops and artillery. We have already mentioned that the "beginning" of this control lies higher up -- in the sphere of activity of the troop commander and his staff. An exercise conducted in the Kiev Military District in November 1960 gives us very interesting data (essentially unchanged even now). Thus, within missile brigades an average of six minutes was spent on assigning tasks; on assigning tasks to brigades -- an average of 30 minutes; and on making a decision from the moment data on the enemy were obtained -- from 60 to 97 minutes. Consequently, 60 to 70 percent of the total time was spent in the sphere lying outside the work of the chief of rocket troops and artillery. Further, we know that an aircraft spends not less than one hour on reconnaissance of a target and forwarding of its coordinates. And if we take it into consideration that the batteries on alert open fire in 15 to 20 minutes, then we will see that the whole process of control (when it is necessary to open fire on one target) takes a lot of time (around three to 3.5 hours). If one compares this figure with the time the enemy missile means stay at positions (two to three hours), then we come to very disturbing conclusions about our capability for using rocket troops to combat hostile nuclear means.

In the chain of the control process under examination, we can see that the weakest links slowing down the whole process the most are the reconnaissance process and the decision-making process. This is why, wholeheartedly welcoming measures for maximum condensation of time in the sphere of activity of the chief and staff of rocket troops and artillery as well as within the rocket troops, and fully supporting the demands of creating for them a specialized automatic control system (forming part of

the combined-arms system), we wish to turn special attention to the necessity of most resolutely shortening the time which is spent at the top.

Unless this is done, automation within the rocket troops will not substantially change anything. We believe that improving the process of reconnaissance, accelerating the transmission and processing of information, speeding up the process of making the decision for a strike, as well as somewhat lightening the load of the combined-arms commander and his staff, which was spoken of above, will help us reduce the intolerable expenditures of time in the process of controlling the fire of the rocket troops.

It is to be assumed that the procedure whereby the launch of nearly every nuclear missile required approval from above has receded into the past. The fluid nature of an engagement, the rapid changes in the situation, and the extensive zones of actions demand that all levels of command be granted greater independence, in particular, the full right to use the means entrusted to them. Based on demands to save time, as well as on the necessity of ensuring the above-indicated independence, we picture the fire control scheme during the delivery of a nuclear strike as follows.

The data about every important target than can be subjected to a nuclear strike which are received by the intelligence directorate of the front, in the staff of the air army, or in the staff of the rocket troops, are immediately reported to the commander of the front, who decides right away who hits the target with what means and when, and right there he issues an instruction either to the commander of the air army or to the chief of rocket troops and artillery of the front (if it is necessary to use front missile means) or to the appropriate army commander (when army missiles are used). Such a procedure eliminates the possibility of bypassing the army commander in assigning a task, as well as wasting time in a number of urgent cases on analyzing the incoming data in the intelligence directorate. This general scheme will look about the same in an army.

The question arises as to whether the chief of rocket troops should not, for purposes of shortening time, be given the right

in certain strictly limited cases to independently carry out the launching of nuclear missiles. We do not see such a possibility. Even under the conditions of a meeting engagement or the perfectly clear necessity of delivering a strike on a most important target, for instance on a means of nuclear attack, the chief of rocket troops and artillery cannot be certain that its destruction will be entrusted to him and not to aviation or other means. No one but the commander of the front or the army can decide this question. It would seem that another approach to this question is possible with respect to the firing of chemical missiles and more so with respect to high-explosive missiles. However, here too the possibility of fulfilling tasks with other means and the necessity of a direct decision of the commander on what means to use in a given case exclude such a supposition.

Nor, in examining the questions of controlling the fire of the rocket troops, must we lose sight of such factors as the number of all kinds of missile/nuclear strikes and the possible daily work load on staffs and units which is directly connected with the delivery of missile/nuclear strikes. As practice shows, for an offensive operation a front receives two or three nuclear missiles per launcher, which averages 12 to 18 missiles for each front and army missile brigade, and four to six tactical missiles for each division. If we exclude from this the initial nuclear strike, which is prepared ahead of time and is consequently not so strictly limited by time as strikes during the offensive, then we will see that, in the course of an eight- to ten-day operation, each brigade will have occasion to expend about ten nuclear missiles, i.e., approximately one missile per day, and the divisions, fewer than that.

Noting that, from this point of view as well, control of rocket troop fire sharply differs from control of artillery fire, which is conducted for days with immeasurably greater intensity that requires the constant and, in fact, incessant work of staffs and communications means, we see that the firing of nuclear missiles is conducted sporadically and very rarely, and timed mainly to decisive events in the operation. This circumstance to a considerable degree facilitates controlling the fire of the rocket troops and forces us to believe that the basic form of missile/nuclear strikes during an operation will be single and grouped strikes.

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In search of ways to improve control of the rocket troops, no few recommendations are expressed about changing their organizational structure. Thus, for instance, the necessity in a number of cases for the transmission of commands by the chief of rocket troops and artillery directly to battalions sometimes gives rise to proposals about eliminating the brigade headquarters. We consider these proposals unacceptable, since they are made without taking into account the other activities of the brigade commander or the minuses connected with the necessity of controlling a large number of subordinates. If it is a question of eliminating intermediate levels, then these should, in our opinion, rather be the battalions. We cannot forget that the classical triangle organization, which is still experienced in our troop structure, corresponded to earlier, now already obsolete, means of control. The introduction of such new means as electronic computers, which are rapidly changing the whole system of control, must inevitably have its effect also on the organization of troops. We believe that the use of the electronic computer at the brigade level with the preparation of the necessary calculations immediately for all its batteries will undoubtedly be more economical than the availability in a brigade of three such computers operating with one-third the load. This is why we lean more toward eliminating the battalions in brigades than the brigades themselves if they are equipped with the appropriate electronic computers.

The above-mentioned proposal to establish major missile large units of the missile corps type also is based on the interests of "convenience" of control, with the most "convenient" method of control being considered centralized control regardless of the situation. Such a proposal is in sharp contradiction to the requirements for strengthening the independence of large units and formations, requirements stemming from the new features of modern operations, changing methods of troop actions, and the very picture of modern engagements.

The recommendations, which have something in common with this proposal, to increase the total number of missile launchers twofold or threefold stemming from the desire to somehow or other bring the number of launchers we have to a level with the number of launchers in the armies of the probable enemy, are based on

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the false notion that the ratio of launchers alone can play a noticeable role in achieving superiority. It is perfectly obvious that launchers themselves do not inflict damage and that the decisive factor is the ratio of warheads (which we do not always take into account) and the skill in employing them.

Increasing the number of launchers will not entail an automatic increase in the issue of nuclear missiles; and if the issue of missiles for a front offensive operation now provides, as we have seen, for the launch of an average of only one nuclear missile per day per brigade from six launchers, then the question is, how many launchers will stand idle every day if there is only one missile for 18 launchers?

In conclusion, let us touch upon one more question.

Many comrades quite reasonably propose increasing the maximum range of all types of missiles in service with the ground forces. In supporting these proposals, we would only like to add that 1,000 kilometers and even more, along with the indisputable advantages, will at the same time entail also a good number of difficulties which will complicate control to an extraordinary degree.

Endeavoring to reduce the number of relocations or even to acquire the capability to accomplish tasks with missiles during an entire operation from basically one area will lead to such an extension of communications as will not only require completely new and accordingly cumbersome radio sets, but it will also make these communications not too dependable. It is obvious that the fire control of units hundreds of kilometers away will be complicated drastically and the time necessary for it, which we are endeavoring to shorten as much as possible, trying to save even minutes, will certainly increase. It also appears obvious that the maintaining of cooperation between the missile/nuclear means and the troops exploiting their strikes will be highly complicated. Finally, new difficulties will arise in controlling the missile technical rear services, the various levels of which will be many hundreds of kilometers from one another. It is not out of the question that part of them, together with the missile brigade itself, may happen to be beyond the range of the control radio station and the rear control post.

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In this brief article we have not, of course, been able to examine fully enough the theme we have touched upon. In particular, we have intentionally not dealt with all the questions of fire control which lie in the sphere of activity of the chiefs of rocket troops and the commanders of missile large units and units. From the sum total of questions making up the content of the theme, we have endeavored to single out those which have fundamental importance and upon the correct solution of which the successful combat employment of rocket troops depends. In setting forth our views on these main questions, we are by no means inclined to consider our treatment of them the only correct one, since we understand quite well that in resolving the questions raised, by no means have all the arguments yet been exploited. If the article to some extent reduces the difference in viewpoints and helps work out more correct views on the rocket troops and control of them, then the objective established in this article can be considered to have been achieved.

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