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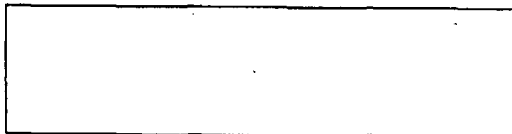
MEMORANDUM FOR: The Director of Central Intelligence

SUBJECT : MILITARY THOUGHT (SECRET): "The Problem of
Combat with the Nuclear Means of the Enemy
and Its Solution", by Chief Marshal of
Artillery S. Varentsov

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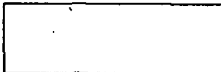
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Richard Helms

Richard Helms
Deputy Director (Plans)

Enclosure



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COUNTRY : USSR

SUBJECT : MILITARY THOUGHT (SECRET): "The Problem of Combat with the Nuclear Means of the Enemy and Its Solution", by Chief Marshal of Artillery S. Varentsov

DATE OF INFO: August 1961

APPRAISAL OF CONTENT : Documentary

SOURCE : A reliable source (B).

Following is a verbatim translation of an article entitled "The Problem of Combat with the Nuclear Means of the Enemy and Its Solution", which was written by Chief Marshal of Artillery S. Varentsov.

This article appeared in Issue 5(60) of 1961 of a special version of the Soviet journal Military Thought which is classified SECRET by the Soviets and is published irregularly. Issue 5(60) was sent to press on 25 August 1961.

Comment: "Military Thought" is published by the USSR Ministry of Defense in three versions, classified RESTRICTED, SECRET, and TOP SECRET. The RESTRICTED version is issued monthly, while the other two versions are issued irregularly. A total of 7 issues of the TOP SECRET version were published by the end of 1961, 3 of them in 1960 and the other 4 in 1961. By the end of 1961, 61 issues of the SECRET version had been published, 6 of them during 1961. The present article is the first one to be acquired from the SECRET version. The existence of the SECRET version was first disclosed

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The Problem of Combat with the Nuclear Means
of the Enemy and Its Solution

by

Chief Marshal of Artillery S. Varentsov

Under today's conditions the strength of belligerents must be assessed primarily in the light of their capabilities and of their capacity for the employment of nuclear weapons. In a modern operation the side which can win fire supremacy over the enemy, primarily in nuclear weapons, will win. The conduct of any operation, especially in the initial period of a war, is inconceivable without reliable destruction of the nuclear means of the enemy.

The experience of exercises and of operational games over the past two years shows that many generals and senior officers still have an inadequate understanding of the complexity of the problem of combat with the nuclear means of the enemy and of the whole set of problems which must be solved in order to reduce his ability to use these weapons against our troops.

As is generally known, our probable enemy has a considerable quantity of means of nuclear attack, such as guided missiles and free rockets and atomic artillery and aircraft which use nuclear ammunition. In the offensive zone of a front there can be approximately the following number of missile and artillery batteries, using nuclear ammunition alone:

-batteries of 203 mm howitzer and 280 mm cannon,
batteries and battalions of "Honest John" and
battalions of "Little John" free rockets (NURS)
and "Lacrosse" -- up to 170;

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-mounts for "Redstone" guided missiles (URS), battalions of "Corporal" or "Sergeant" guided missiles, detachments of "Matador" or "Mace" cruise-missiles -- up to 20.

It is fully understandable that nuclear weapons must be destroyed in the shortest possible periods, calculated in minutes, after they have been detected in order to prevent the enemy from delivering nuclear strikes. First of all, in every case, the missile and artillery batteries using nuclear ammunition, located at launch and firing sites, must be destroyed. In this process, primary attention should be given to the destruction of batteries of long-range missiles such as the "Redstone", "Corporal", "Sergeant" and "Pershing". The range of these batteries permits the enemy to deliver nuclear strikes against our missile units and against the disposition areas of combined-arms large units and command posts and airfields.

Reconnaissance must be aimed first of all at providing mensuration data (izmeritelnyye dannyye) on the enemy's missile batteries, armed with "Redstone", "Corporal", "Sergeant" and "Pershing" missiles. At the same time, the disposition of the nuclear means of divisions deployed on the immediate border during the initial period of a war or in direct contact with our troops during the war must be reconnoitered.

As is generally known, our probable enemy imposes great tasks on his aviation in the delivery of nuclear strikes against our troops. To be specific, aviation may receive 60 to 70 percent of the total of the nuclear weapons allocated for an operation. Consequently, the destruction of aircraft on the airfields where they are based, is one of the most important tasks in the combat with the nuclear means of the enemy.

In the zone of a front there may be up to 40 or 50 airfields for the enemy's tactical aviation. Since these will normally be reliably protected by a whole system of anti-air defense, the delivery of strikes against them will be entrusted to the missile troops in the first instance.

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Not only the missile troops of a front but also those of the High Command (Glavnoye Komandovaniye) will operate against the airfields in the initial period of a war. To destroy the aircraft of the enemy which use nuclear ammunition is, figuratively, to tear the nuclear sword from his hands.

Together with the missile batteries and aviation, the most important targets in the combat with the enemy's nuclear means are the assembly bases and depots for them. The main mass of nuclear ammunition, and, during initial combat operations, up to 50 percent of the nuclear ammunition which it is planned to use in the operation, may be located at these points in the initial period of a war. The destruction of the assembly bases and depots for nuclear ammunition is also one of the most important tasks, not only of a front, but also of the missile troops of the High Command. The destruction of the assembly bases and depots for nuclear ammunition in a theater of military operations radically weakens the enemy in his use of nuclear weapons against our troops. If the destruction of these targets is skilfully organized, the enemy will be compelled not only to revise (redistribute) but also materially to restrict his expenditure of nuclear weapons.

In order to be sure of weakening the enemy in his use of nuclear weapons against our troops, it is necessary to devote most serious attention to the destruction of such targets as command posts, control centers for reconnaissance and artillery fire-directing aircraft and the enemy's radio-technical means.

At command posts all the questions connected with the combat use of nuclear weapons are worked out. Specifically, the reconnaissance of targets is organized; plans are made for the delivery of nuclear strikes, and for the direction of missile units and aviation up to the issue of the necessary commands for the delivery of nuclear strikes. Destruction of the enemy's command posts therefore makes it possible to resolve the main problem - the substantial weakening of the enemy in his organization of the use of nuclear weapons.

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In resolving the questions of combat with the enemy's nuclear means, the destruction of his command posts must be undertaken boldly and decisively, not only in the zone of a front, but also throughout the whole theater of military operations. It is desirable for the strikes against command posts to take place during a massed strike, simultaneously with strikes against the nuclear targets and the more important groupings of the enemy.

The enemy's reconnaissance and artillery fire-directing aircraft are the means which allow him to expose the grouping of our troops, including the disposition areas of missile units and subunits, and to obtain mensuration data on these objectives in order to deliver nuclear strikes against them. If we deprive the enemy of his reconnaissance and artillery fire-directing aircraft, we will by so doing ensure the fulfillment of the basic task of weakening the enemy in the effective employment of nuclear weapons, since without aircraft it will be extremely difficult for him to obtain the necessary mensuration data on our objectives. Having been deprived of reconnaissance and artillery fire-directing aircraft, the enemy will be unable to make use of a considerable number of his nuclear means with sufficient effectiveness. This applies particularly to repeat (povtornyy) strikes, before which combat reconnaissance (dorazvedka) must, without fail, be conducted. Not having the capability to organize combat reconnaissance, the enemy will deliver many strikes inaccurately and against empty areas.

Enemy reconnaissance and artillery fire-directing aircraft must be destroyed, primarily, by our nuclear strikes against the airfields where they are based and the surviving aircraft during the period of their combat activity, by the means of the antiair defense.

The timely destruction of the main radio electronic intelligence centers of the enemy is also of considerable importance. The work of these centers can be made more difficult to some extent by the setting-up of various types of interference.

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In this way, in order to weaken the enemy fundamentally in his employment of nuclear weapons and in order to achieve supremacy with them, reconnaissance must be purposefully organized and mensuration data must be obtained on such enemy objectives as:

- the launch sites of missile batteries;
- the firing positions of artillery batteries which use nuclear ammunition;
- the base airfields of bomber and fighter-bomber aircraft;
- the assembly bases and depots for nuclear ammunition.

In addition to these basic objectives, it is also necessary to obtain mensuration data on the command posts of groups of armies, field armies, army corps and divisions; on aviation control centers; on base airfields for reconnaissance and artillery fire-direction aircraft and on the main centers of radio electronic intelligence.

In the initial period of a war the task of destroying the enemy's nuclear means must be performed by the first massed strike, before the ground forces of the front go over to the offensive, often against previously reconnoitered objectives; under these conditions prior reconnaissance of the main nuclear objectives may take place only with the permission of the commander of the troops of the front, depending on the number of aircraft which are determined to be available to fly over the border in the course of 24 hours.

In the course of a war, the task of destroying nuclear means should be completely performed by a massed strike at the beginning of an offensive operation by a front and then, as they are exposed and as mensuration data are received, by single, or if necessary, by grouped nuclear strikes. During the "pauses" between operations (if these occur) enemy nuclear objectives must be destroyed as they are exposed, by single, or if necessary, by grouped nuclear strikes.

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One of the most important tasks in the period of preparation for an offensive operation is not to allow the enemy to carry out a nuclear strike on the main grouping of the troops of a front, in order to break up our offensive. If it becomes positively known that the enemy is preparing and will try to deliver such a strike, it will be necessary to forestall it and, with a massed nuclear strike of our own, to destroy as great a number as possible of the above-mentioned objectives. In order to perform this task, in accordance with their deployment, missile units must immediately prepare for strikes against nuclear and then against other objectives on which the enemy's capability to organize the use of nuclear weapons depends.

In defense, in order to break up an enemy offensive, it is also necessary to plan a massed nuclear strike directed primarily against the nuclear means, command posts and main groupings of the enemy's troops. Such a massed strike, successfully executed and supplemented by new strikes against the enemy troops (if this is necessary), will allow a transition from the defensive to the offensive.

From what has been said, it is evident that in organizing combat with the nuclear means of the enemy, we cannot be restricted to reconnaissance and to the destruction of subunits which are immediately capable of using nuclear weapons. The task of the struggle for nuclear supremacy is considerably greater. It must include combat with the whole complex of forces and means, which the enemy makes use of in employing nuclear weapons.

To perform this task it is necessary to establish an orderly and all-embracing system, in which will be included all the forces and means necessary for reconnaissance and destruction, a well-organized rear area and, lastly, precise control.

Let us first examine the means of destruction which can be used to weaken the enemy, in the nuclear sense. These are, above all others, nuclear missile weapons, which have great range coverage (diapazon dalnosti) and vast destructive capability.

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The principal tasks in combating the nuclear means of the enemy will be accomplished by missile large units and units of the ground forces — missile large units and operational-tactical units and independent (otdelnyy) battalions of tactical missiles.

At present missile large units and tactical operational missile units are organizationally presented as army and front missile brigades and as independent missile battalions attached to fronts for reinforcement. In addition, for combat with the enemy's nuclear weapons, the battalions of tactical missiles of the motorized rifle and tank divisions, can be used in an army. Thus, a front has missile weapons capable of combating the enemy's nuclear means, disposed within the limits of both the tactical and the operational depth.

In case of need, missile large units and units of the missile troops of the High Command may also be called in to combat the enemy's nuclear means on behalf of a front. They will be used for the destruction of the main enemy nuclear objectives, which are unattainable for the missile troops of the front or for the front's aviation. To such objectives belong the assembly bases and depots, the launch sites of long-range ballistic missiles, communications centers, airfields, ports, loading and unloading stations and the sites of cruise missiles which have great range of action.

The characteristics of means of combat, besides the range of fire, are the time needed to prepare for the delivery of a strike after receipt of the command, the accuracy of fire and the yield of the nuclear warhead.

The time taken to prepare the missile for launching has particular significance in the destruction of the enemy's nuclear weapons at their sites. After a target has been detected at a site, it is necessary to destroy it as quickly as possible, in order to forestall the enemy in the delivery of a strike. Here we must bear in mind that the enemy's nuclear means will be at their sites for a very limited time before delivery of the strike. Thus, for

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example, a battery of "Honest John" or "Lacrosse" requires not more than 30 minutes to occupy a position and to prepare to open fire, a battery of "Sergeant", up to one hour. It is true that, when detected, these weapons may be at varying degrees of readiness to deliver a strike; and if we take their readiness as 50 percent, we will have an average of 15 minutes to destroy tactical missiles and atomic artillery and 30 minutes to destroy operational tactical missiles.

In defining the time for the delivery of strikes against the enemy's nuclear weapons one must also consider the reliability with which they can be destroyed. This must be not less than 90 percent. In order that this reliability can be ensured, the above-mentioned period will shorten still further; for tactical weapons from 2 to 9 minutes and for operational-tactical weapons, from 10 to 25 minutes. During this period, the reconnaissance data must be received and processed, a decision must be taken and relayed to the firing subunits and the latter must be prepared for the delivery of a strike or for opening fire.

As the experience of exercises has shown, a large proportion of this period is spent in the receipt and processing of reconnaissance data, since they pass through many departments, and also in the making of a decision and in relaying it to subunits. Thus, for example, on a series of exercises, up to 40 to 50 minutes were spent in the making of a decision and in allocating a strike mission against the enemy's nuclear means.

The periods taken to prepare subunits for the delivery of a strike or for opening fire are at present shortened to the utmost and are limited only by the technical capabilities of the firing means. At the present time duty (dezhurnyy) missile subunits of army and front missile brigades can be ready to launch a missile within 15 to 20 minutes of the receipt of the coordinates of a target, and subunits of tactical missiles within 8 to 10 minutes.

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The accuracy of fire of the missiles must be sufficiently high, or alternately must be compensated for by greater yield in the nuclear charges.

According to all the indications which have been examined, the existing types of missiles of the ground troops are fully suitable for combat with the enemy's nuclear means. In the table which is shown below, the characteristics of enemy objectives are given, and the approximate yield of the nuclear charges, which can be used in operational-tactical and tactical missiles, is indicated.

From analysis of the table it is clear that the missile units of the ground troops can successfully combat all the troop objectives of the enemy which are connected with the employment of nuclear weapons. In accordance with the yield of the nuclear warhead used to destroy one objective or another, the problem of destroying either both materiel and personnel or only the personnel and some of the equipment can be resolved.

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| Target | Area in km ² | Distance from the front line in km | Element of the target which is to be destroyed | Necessary yield of the nuclear warhead expressed in kilotons | Type of missile |
|---|-------------------------|------------------------------------|--|--|-----------------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| Battery of 80mm howitzers on site | 1 | 4 to 8 | Personnel in trenches | up to 10 | R-30 |
| Battery of 80mm cannon on site | 2 to 4 | 4 to 10 | Personnel in trenches | up to 10 | R-30 |
| Battery of "Honest John", free rockets on site | 1 | 4 to 12 | Material | up to 15 | R-30 |
| Battalion of "Honest John" free rockets ("Lacrosse" guided missiles) on launch site | 1 to 5 | 4 to 10 | Unprotected personnel | up to 2 | R-30 |
| Battalion of "Honest John" ("Lacrosse"), in concentration area | 8 to 9 | 20 to 40 | Unprotected personnel | up to 15 | R-30 |
| Battalion of "Corporal" guided missiles, in concentration area | 9 to 12 | 50 to 80 | Unprotected personnel | 5 to 10 | R-170 R-300 |
| Individual "Corporal" mount on site | --- | 30 to 60 | Material | up to 25 up to 20 | R-170 R-300 |
| Individual "Redstone" guided missile mount, on site | --- | 65 to 90 | Material | 30 to 150 25 to 55 | R-170 R-300 |
| "Redstone" artillery technical and engineer companies | 1 to 1.5 | 70 to 100 | Unprotected personnel and equipment | 8 to 25 7 to 10 | R-170 R-300 |
| Detachment of "Matador", ("Mae") cruise missiles on launching platform | --- | 120 to 150 | Material | 10 to 55 10 to 20 | R-170 R-300 |
| Detachment of cruise missiles in sitting area | 4 to 6 | 120 to 150 | Unprotected personnel | up to 25 up to 20 | R-170 R-300 |
| Preparatory area for a group of cruise missiles | 4 to 8 | 130 to 160 | Material | up to 50 up to 25 | R-170 R-300 |
| Tactical aviation airfield | 30 | 150 to 400 | Aircraft | up to 15 | R-300 |
| Airfield for artillery fire-director and reconnaissance aircraft | 7 to 15 | 40 to 80 | Aircraft | 1 to 5 1 to 2 | R-170 R-300 |
| Command post of a group of armies, field army | 2 to 15 | 60 to 170 | Radio stations and shelters | 50 to 100 50 to 60 | R-170 R-300 |
| Command post of an army corps (K - armyskiy korpus) | 1 to 4 | 15 to 50 | Radio stations | 10 to 60 10 to 20 | R-170 R-300 |
| Command post of a division | 1 to 2 | 10 to 20 | Armored transport | 5 to 10 15 to 60 | R-30 R-170 |
| Aviation control and guidance center | 2 | 30 to 50 | Radar | 35 to 60 10 to 20 | R-170 R-300 |
| Center for control of aviation in the sector | 1 | 100 to 200 | Radar | 15 to 100 10 to 20 | R-170 R-300 |
| Army supply point | 4 | | Nuclear ammunition in shelters of a light type | 300 and more 200 to 600 | R-170 R-300 |

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The proper selection of the element of a target which is to be destroyed is of very great significance. For example, the combat formation of a group of "Redstone" guided missiles consists of the firing positions of the launch batteries and of the disposition areas of the fire control point, of headquarters, engineer and technical artillery companies, at distances of 4 to 13 km from one another. The launching mounts on the launch sites and the engineer and technical artillery companies can serve as independent objectives for destruction. At the different periods of their combat operations one of these objectives will assume the greatest importance, and if reconnaissance provides the necessary data, the point of aim for the strike must be set there. Otherwise, we will be compelled to deliver a strike against all the objectives which have been exposed.

A group of "Matador", ("Mace") cruise-missiles are disposed in two areas, preparatory and launching, separated by a distance of 6 to 7 km. As a whole, a group of cruise-missiles constitutes four separate objectives for destruction.

A tactical aviation airfield (one squadron on the airfield) may occupy an area of 30 to 50 km². However, the aircraft on their hardstands, the fuel and munition depots, or the control points, disposed over considerably smaller areas, may be selected for destruction.

Supply points and depots for special types of weapons, depending on their significance, (points in corps rear areas, army depots, depots in the forward area or base depots in the administrative zone) may have between 5 to 6 and 12 to 18 separate storage places, disposed in separate groups (of 2 to 3 storage places) at distances of 6 to 7 km from one another. For the destruction of a whole point or depot, as many nuclear warheads as there are separate groups of storage places exposed by reconnaissance will be needed.

In delivering nuclear strikes against objectives it is necessary to select the type and height of the nuclear burst properly. Air bursts will be those most frequently produced;

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although for the destruction of a series of objectives, especially of those which are deeply disposed, ground bursts may be more effective, providing greater destruction of the enemy by the generation of high levels of radioactive contamination of the area.

For the destruction of the enemy's nuclear means in operational and tactical depth, operational-tactical and tactical missiles with chemical filler (v khimicheskoy snaryazhenii) may be used; but in this case, as in the case of nuclear ground bursts, the possible direction of the wind in the target area must be considered. To destroy 75 to 80 percent of the personnel of a battalion (battery) of "Honest John" rockets, of 203 mm howitzers or of 280 mm cannon, firing at a minimum distance, two, and at a maximum distance, three of four tactical missiles with chemical fillers will be required.

Artillery is sufficiently effective for combat with the enemy's tactical nuclear means, especially long-range gun artillery. The ability of artillery to open highly accurate fire quickly permits it to be considered at present as one of the important means of combat with the 203 mm howitzers, 280 mm cannon, "Honest John", and "Lacrosse" missiles on their firing positions, and also as a means for the destruction of their observation and command posts and radar station sites.

The main quantity of the enemy's nuclear means, as is generally known, is located within the limits of the tactical depth, at a distance of 5 to 30 km, from the forward edge (perednyy kray). As a result, the main burden of combat with them falls upon the missile battalions and divisional artillery and also upon the army missile units.

The enemy's tactical means for nuclear attack, located at positions within the range of tube artillery, may be destroyed by the fire of the latter. The expenditure of shells will depend on the dimensions of the target, the range of fire, the method of determining coordinates, and the method of preparing data for firing. With the greatest accuracy of fire preparation, an "Honest John" or "Lacrosse" battery can be destroyed by a battalion within 5 to 15 minutes, with an expenditure of 150 to 400 missiles.

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The effectiveness of destruction is increased if chemical warheads are used. In such a case the expenditure of shells can be less. However, for this it is necessary that the fire against the enemy is carried out unexpectedly and that he is not able to take advantage of antichemical installations or of other means of defense.

In destroying the nuclear means of the enemy, tube artillery must bring fire to bear not only on the firing or launch sites but also on the fire control points of these subunits. For example, the fire of tube artillery against the radar guidance station of a battalion of "Lacrosse" disposed at a distance of 1 to 2 km from the forward edge can knock the battalion out of action for a prolonged period. Thus, tube artillery must take its position in the overall system of combat with the nuclear means of the enemy. In our opinion, it is necessary to have more long-range gun artillery in an army.

One must keep in mind that, at present, only missile units and artillery are capable of destroying the enemy's missile mounts and artillery weapons in timely fashion at their launch sites or firing positions before they deliver strikes against our troops, that is, in the course of several minutes.

Besides this, it is clear that the existing periods for the preparation of the weapons of nuclear attack of the enemy will not remain the same for any length of time; they have a constant tendency to become shorter, in accordance with the assimilation of missile equipment and with the introduction into the latter of electronic instruments for the checkout and preparation of missiles for launching.

Therefore, bearing in mind that a considerable number of the enemy's nuclear weapons will be located on launch sites or firing positions during the course of an operation, we must have a system for combat with them which can ensure their destruction within the very shortest periods.

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The methods for the organization of control and the views on the employment of missiles and artillery for the destruction of nuclear means, which exist at present, do not correspond in any degree with present requirements. For example, for the destruction of a "Corporal" guided missile, detected on its site, we must open fire within 10 to 25 minutes from the moment of its detection; but on some exercises up to 1½ hours and more were required for this. An analysis of the organization of similar strikes in a series of exercises shows that a great portion of this excessively long time is taken up with transmission and analysis of reconnaissance data, with preparation and with the making of a decision in the staff of a front or an army.

The only proper path, along which we must go, is that of a decisive examination of views on the organization of the combat with nuclear means.

First of all, clearly, a definite minimum of nuclear warheads must be specially designated, from the total number allotted for an operation, for combat with the nuclear weapons of the enemy. This fundamental decision is made by the commander of the troops of a front (army) while nuclear warheads are being distributed in accordance with the tasks of an operation and by armies.

A decisive simplification of the whole structural scheme for the control of nuclear/missile weapons in the combat with the nuclear means of the enemy is also needed, eliminating a series of levels, and, as a result, considerably shortening the time for the preparation of the means of destruction for the delivery of strikes. It seems to us that the responsibility for the employment of missile units and artillery in combat with the enemy's nuclear weapons should be entrusted entirely to the commander of missile troops and artillery. This suggestion is also substantiated by the experience of exercises.

Arising from the need for the rapid destruction of enemy nuclear means which have been detected, we consider that the commander of the missile troops and artillery must

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be given the right to make independent decisions on the delivery of nuclear strikes against the nuclear means of attack of the enemy, with the limit set by the commander of the troops of a front (army) for the destruction of the enemy's nuclear means.

Besides the means of destruction, the commander of the missile troops and artillery of a front (army) and the commander of the artillery of a division should have the necessary reconnaissance means to obtain the coordinates of targets and also to conduct combat reconnaissance of the enemy's nuclear means and a check on the results of fire. In accordance with this, clearly, it is necessary to make definite changes in the organizational and organic structure of missile and artillery units of artillery reconnaissance units and of subunits at divisional army and front levels.

To conduct reconnaissance of the nuclear means of the enemy, the commander of the artillery of a division must have pilotless means of reconnaissance — not less than two flights (zveno) of artillery-fire-direction helicopters (vertolet -korrektirovshchik) and also subunits for sound-ranging (zvukovoy) and radar reconnaissance and subunits for reconnaissance of the enemy's radar. In the future, a division will also require light air-reconnaissance aircraft. Divisional artillery must have not only howitzer artillery but also the necessary quantity of long-range (gun) artillery. Given such means of reconnaissance and destruction, the division will be able to combat the enemy's tactical nuclear means successfully.

With their own means, an army and a front will combat the nuclear means of the enemy disposed in the operational depth. To these belong "Corporal", "Sergeant" and "Redstone" guided missile battalions, detachments of "Matador" and "Mace" cruise missiles, depots and supply points for special types of weapons, airfields and command posts. In case of necessity front and army means will also supplement the means of divisions.

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For the support of army missiles, in an army besides the ground means of reconnaissance, there should be means for air reconnaissance, including aircraft, helicopters and pilotless means. In a front, in addition to reconnaissance and artillery-fire-direction aircraft, it is necessary to have pilotless means of reconnaissance.

The need for specially trained air reconnaissance subunits under (v rukakh) the commander of the missile troops and artillery of a front (army), with apparatus for the determination of the coordinates of targets, is confirmed by the experience of exercises. On one of these, for example, 66 objectives were reconnoitered by the forces of a front; but their coordinates, which only artillery-fire-direction aircraft could provide, were determined for only 16 objectives.

For a fundamental solution of the questions of combat with the nuclear means of the enemy, it is necessary to provide the commanders of missile troops and artillery of a front and an army and also the divisional level with reliable means for reconnaissance and destruction. We should note, incidentally, that during World War II all the necessary means for reconnaissance and destruction were under the orders of the artillery commander and that, thanks to this, counter-battery combat was of a continuous nature.

As has been pointed out above, various forces and means, from the complement of all arms of troops, will be brought in to the combat with the nuclear means of the enemy. The effective use of all these means is inconceivable without well-organized, operational and efficiently functioning control at all levels, beginning from the planning and ending with the actual assignment of missions to the means of reconnaissance and destruction, and also checking on their timely completion. The responsibility for organizing combat with nuclear means rests with the commander of the troops of a front (army), and the commander of a division.

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Control of the means of destruction in a front or in an army is carried out in accordance with the plan of combat against the enemy's nuclear weapons. This plan is worked out under the direction of the chief of staff of the front (army) by the operations and reconnaissance directorates (departments), together with the staffs of the missile troops and artillery and of the air army. In the plan the following questions should be reflected:

- the grouping of the enemy troops, especially of his nuclear means;
- the limit of ammunition with nuclear, chemical and conventional fillers planned for use in combat with the enemy's nuclear means and their distribution by tasks (days) of an operation and by armies;
- the limit of the flying resources of the aviation and their distribution;
- the position of the reconnaissance units and sub-units and of the means of destruction brought in for combat with the enemy's nuclear means;
- tasks of the combat with the enemy's nuclear means which are entrusted to a front, to an army and to a division;
- the distribution of these tasks between the different means for reconnaissance and destruction;
- the arrangement for the movement of means during the course of the operation;
- the tasks of the combined arms (especially tank) large units and formations in the destruction of the means of nuclear attack and in the disruption of the basing of nuclear weapons along the axis of the main strike;

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-the organization of control of the means which have been brought in (the organization of communications, signals, call signs, etc).

The plan may be represented graphically on a map or written.

It is quite clear that combat with the enemy's nuclear means must be waged continuously both in the preparatory period of an operation, and while it is being conducted. However, the most vigorous operations of the main mass of means for reconnaissance and destruction, will clearly be timed for certain moments of the operation, when the most crucial tasks are being performed, such as the commitment to battle of the second echelons, the repulse of counter-attacks, the forcing of water obstacles etc.

The plan for radio counter-measures evolved by the operations directorate should be drawn up with regard to the requirements for combat with the enemy's nuclear means. Support for this combat must be planned and carried out in the first instance.

The movement of the whole complex of means during the course of an operation must be planned on such a basis as to ensure the constant readiness of the latter to perform tasks at any time of the day or night and under any circumstances.

The commander of the missile troops and artillery of a front must be the principal organizer of the employment of the missile troops of the front in combat with the enemy's nuclear means. On the basis of the plan drawn up by the staff of the front, he, with his staff, works out all the questions connected with the organization of the combat of the front's missile troops with the enemy's nuclear means, reflecting them in an appropriate plan.

The role of the commander and staff of the missile troops and artillery in the planning and organization of the operations of duty missile subunits, whose basic function is the destruction of the enemy's nuclear means, is especially important. As is generally known, the duty missile batteries,

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which are on launch sites, in a state of readiness to deliver a strike in relatively short periods, namely the duty batteries under the command of the commander of missile troops and artillery, are the means with whose help the latter can most quickly deliver strikes against objectives which have been exposed.

In planning the operations of the duty batteries, the commander of the missile troops and artillery of a front (army) determines their number, the units and subunits, from which they should be detached, the number of nuclear warheads, and the procedure for their preparation and supply, the organization of communications, etc.

The commander of the artillery of a division must plan, in detail, the use of a battalion of tactical missiles and tube artillery, both for combat with the enemy's tactical nuclear weapons, and for combat with his artillery as a whole.

At the present time, when an army operates in a wide zone and its divisions carry on combat operations at a considerable distance from one another, combat with tactical nuclear means and artillery can most successfully be performed only in the divisions. This is why a division must be provided with a sufficient quantity of artillery, especially with long-range artillery, and also with reconnaissance means, which were discussed above.

An army and a front, with the missile units, as we already said, will carry on the combat with the enemy's nuclear means which are disposed in the rear and will also supplement the fire of battalions of tactical missiles and of divisional artillery against tactical weapons. In conformity with this, the functions of the commanders of the missile troops and artillery of a front and of an army and of the commander of the artillery of a division are determined. They must respond operationally exclusively to the incoming data on enemy nuclear means which have been exposed, make decisions and quickly give the necessary commands to open fire.

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The system for the control of the means of reconnaissance, of the missile troops and artillery, under the commander of missile troops and artillery must be similar to the control systems set up in the anti-air defense troops.

At the command posts of the commanders of missile troops and artillery, reconnaissance data should be quickly plotted on a fire control map or on an appropriate artillery board and the command to open fire should be transmitted automatically, spending only several seconds in all on this.

The command posts of commanders of missile troops and artillery of missile brigades, battalions and batteries should be equipped with electronic computers and with different calculators and the means of communications between them must provide dependable, fast and enciphered transmission of information and commands. Unfortunately, for the moment there are no such means.

In order to be ready to carry out the tasks of combat with the enemy's nuclear means, already, today, the staffs of the commanders of missile troops and artillery must be in a position to set up two fire control groups, with a number of well-prepared and trained officers. Control groups should be supplied with well-equipped mobile command posts, provided with all the necessary instruments, appliances, selective communications, and other means of light automation.

In order that the appropriate instructions and commands for the destruction of objectives may pass without obstruction, it is essential that a special channel of communications should be allocated between staffs of a front, an army, and a division, and also that measures necessary for the granting of special priorities in the use of all lines of communications should be envisaged, up to the automatic disconnection of any subscribers and the clearing of a channel of communications for the time of the transmission of a command. Channels of communications must be dependably paralleled by different means of communications assigned for the direction of the fire of the missile troops of a front, an army, and a division.

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It is necessary to determine in detail the operating procedure at all levels of the system for control of the means of combat with the enemy's nuclear weapons, for the maintenance of commands (instructions) for appropriate documentation etc, and to improve this system daily, as is done in the fire control of the missile troops and artillery.

At the present time an unceasing struggle is being waged in the missile troops and artillery to shorten the time for the preparation of nuclear strikes along the whole chain - from the commander of the missile troops of a front to the launch sites. Work on the shortening of time is carried on in all branches (napravleniye), the implementation of a series of technical decisions, the training of the personnel of staffs at all levels by systematic instruction, an increase in efficiency within each staff, especially among army generals and officers who are being brought directly to the control of fire; the equipment of working areas and of the personnel of control groups with different instruments and appliances; the setting up of special control machines; the introduction of selective communications; the use of accurate, brief, laconic commands and instructions with the use of codes which are simple to use but sufficiently reliable. The work which has been done has already yielded positive results. Thus, on one of the exercises, from the moment when the task of delivering a nuclear strike was received by the commander of the missile troops and artillery of a front (army), to the launch of a missile, from 20 to 30 minutes were used, which included the preparation of the missile for firing.

However, at present, a shortening of time has been achieved in only one portion of the whole system of control. Unfortunately, 2 to 3 times as long was used for its other portion -- from the moment of detection of the target by reconnaissance to the making of a decision by the commander of the troops of a front (army).

Consequently, it is necessary to turn our attention to coordination of the whole system of control beginning from the staff of a front (army) and ending with the immediate ex-

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ecutors. An assessment of the operation of this system must be considered as an important element in the overall assessment of the training of the staffs of fronts, armies and divisions. It would be quite reasonable, in the near future, to develop a special manual or instruction on the operation of this system and a special complex of typical missions to test the ability of staffs to carry out effective combat with the enemy's nuclear means.

Such, in the main, are the problems of the organization of combat with nuclear means which, in our opinion, must be resolved by the missile troops and artillery.

We also consider it necessary to dwell briefly on the problems of other arms of troops in combat with nuclear means, since the missile troops and artillery carry on this combat in close coordination with them, in the first place with aviation, and with the tank and airborne troops.

An important role in the combat with the enemy's nuclear means must be played by aircraft, whose advantage lies in its ability to carry on the struggle with nuclear means which are on the move most effectively. In the course of an operation, the enemy's nuclear means, like our missile units and subunits, will be on the move for 30 to 50 percent of the time, not only at night, but also in the daytime, when aircraft can operate most successfully. Furthermore, it is necessary to bear in mind, that during a period of movement the enemy's nuclear means can be detected considerably more quickly than they can in well-camouflaged siting areas or build-up areas. In these periods, aviation must display its maximum powers in the combat with the enemy's nuclear means.

The weaknesses of aviation are its dependence on meteorological conditions and its vulnerability to the enemy's anti-air defenses. With proper organizational coordination between missile troops and aviation, one can use the advantages of each of these means, taking account of and minimizing their shortcomings.

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The antiair defense troops of the ground troops should also be used in the overall system of combat with nuclear means. First of all, they can destroy the aircraft of the enemy's reconnaissance aviation. The main task of the antiair defense troops will be the destruction of delivery aircraft for nuclear bombs and cruise-missiles. The question of the development of complexes which would be able to carry on the combat with the enemy's missiles in their flight trajectory already exists. These complexes are an important means for combat with the enemy's nuclear weapons.

Besides the missile troops, artillery, aviation, and antiair defense troops, other forces and means which are under the orders of a front and an army, -tank and airborne troops, diversionary-reconnaissance groups and radio-technical means - should be drawn into the combat with the enemy's nuclear means.

The experience of the Second World War shows that during actions in the operational areas, tank troops frequently destroyed the enemy's artillery on the march or in build-up areas, seized or destroyed munitions depots, etc. In a modern war there will be considerably more opportunities for actions by tank troops in the enemy's operational rear. In all cases, one of the missions of the tank troops should be the destruction of the enemy's nuclear means.

In the course of combat operations, tank troops may carry on the fight with atomic artillery, guided missiles, and free rockets at sites, in build-up areas and on the march, destroying both personnel and materiel in the process. Operating in the operational rear, tanks are also capable of disrupting the support system of special types of weapons, of destroying depots, command posts and others.

For combat with the enemy's nuclear means it is also necessary to use airborne troops. Surely, in a modern operation, together with the seizure of individual areas

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of bases of operations, a no less important task will very likely be the seizure and destruction of the enemy's nuclear means, particularly of depots for special types of armament, of subunits of "Redstone", "Sergeant" and "Corporal" guided missiles, and others. In the planning of an operation, the actions by airborne troops, assigned to combat with the enemy's nuclear means, should be integrated with the operations of other means of destruction and in the first instance, with the operations of the missile troops, of aviation, and of tanks.

The operations of diversionary-reconnaissance groups can be of definite significance in the combat with the enemy's nuclear means. These groups can operate with particular success along the routes for the supply of missiles and nuclear charges from depots and assembly bases to units and subunits. Operating from ambush or making raids on the transports carrying missiles or nuclear charges, diversionary-reconnaissance groups can inflict considerable damage. An attack by diversionary-reconnaissance groups on a position of the enemy's nuclear means is also entirely feasible. Here it is expedient to attack the most vulnerable elements of a combat formation, on which the combat effectiveness of the whole unit or subunit is dependent. For example, in a "Corporal" battery, it is sufficient to knock the radar guidance station out of action, and the battery will be unable to undertake the launching of a missile.

Finally, radio-technical means should be widely used in the combat with the enemy's nuclear means. They can be employed for this purpose in two ways: for intelligence on the enemy's radio-technical means and for the creation of interference in the operation of the enemy's radio and radar apparatus. By the skilful use of radio-technical means, in combination with other means for reconnaissance and destruction, one can achieve sufficiently effective results.

Only some of the questions of combat with the enemy's nuclear means have been touched upon in the present article. Since this struggle is a most important problem, its solution calls for great efforts by all arms of troops and, in the first instance, by the missile troops, aviation, and artillery. The military academies, the scientific-research institutes, and the troops must join in to solve this problem. Only by their common efforts can it be resolved in the shortest periods of time.

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