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MEMORANDUM FOR: The Director of Central Intelligence

FROM : John N. McMahon
Deputy Director for Operations

SUBJECT : MILITARY THOUGHT (USSR): Fortified Lines and Protected Troop Disposition Areas in Highly Mobile Operations

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 proposes that combat vehicles and tanks can and must be able to provide their own protection against nuclear weapons at defensive lines and other stationary positions. This can be done by making them airtight, adding reinforcement in some cases, and equipping them so they can dig pits and be covered with a protective layer of earth in two to four hours, thus becoming combination fire points and personnel shelters. Some brief recommendations are also given on the layout of defense lines and the use of obstacles. This article appeared in Issue No. 6 (67) for 1962.

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

John N. McMahon

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MILITARY THOUGHT (USSR): Fortified Lines and Protected Troop Disposition Areas in Highly Mobile Operations

SOURCE Documentary

Summary:

The following report is a translation from Russian of an article which appeared in Issue No. 6 (67) for 1962 of the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal "Military Thought". The author of this article is Engineer-Colonel B. Mikhaylov. It proposes that combat vehicles and tanks can and must be able to provide their own protection against nuclear weapons at defensive lines and other stationary positions. This can be done by making them airtight, adding reinforcement in some cases, and equipping them with light bulldozer blades or other earth-moving equipment so they can dig pits and be covered with a protective layer of earth in two to four hours, thus becoming combination fire points and personnel shelters. Some brief recommendations are also given on the layout of defense lines and the use of obstacles.

End of Summary

Headquarters Comment:

After 1962 the SECRET version of Military Thought was published three times annually and was distributed down to the level of division commander. It reportedly ceased publication at the end of 1970. [redacted]

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Fortified Lines and Protected Troop Disposition Areas in Highly Mobile Operations

by

Engineer-Colonel B. MIKHAYLOV

As is known, the employment of missile/nuclear and chemical weapons and the equipping of troops with the latest transport equipment make modern operations very highly mobile. Massed nuclear and chemical strikes in an offensive operation open the way for the rapid advance of large units and formations of ground forces and the landing of airborne landing forces at a great depth for the purpose of seizing the most important enemy targets.

In modern operations the advance of troops at a rate of 100 kilometers a day during battles and engagements, and at a rate of 300 kilometers a day on the march is considered realistic. This kind of rapid advance and movement of troops makes it possible to exploit the results of massed missile/nuclear strikes and is a most important condition for success. It also ensures a high degree of troop survivability, since by changing their disposition areas often and by presenting dispersed linear targets, the rapidly advancing elements of a troop battle formation and operational disposition are not easily vulnerable to missile weapons.

However, it is evidently impossible to count on the non-stop advance of troops when the enemy is also equipped with modern weapons and is pursuing decisive objectives. Characteristic of an offensive operation will be massed missile/nuclear strikes, meeting engagements and battles, and an effort by each side to prevent the movement forward of troops following nuclear strikes and to reduce in every way the effectiveness of the strikes.

During an offensive operation carried out to ensure the successful advance of the main forces, fortified lines with obstacle zones will have to be set up repeatedly. These will be prepared by a part of the forces of the advancing groupings in order to repel counterattacks, localize enemy success in a meeting engagement, cover the flanks on critical axes, hold important lines, installations, and natural barriers, and cover

regroupings. The high rate of advance of the troops requires that these obstacle zones and fortified lines be set up rapidly by small forces of the ground forces themselves and partly by airborne landing troops.

A sudden shift in the situation and abrupt changes in the balance of forces will oblige troops during an offensive operation to go over to defensive actions with a part of their forces for the sake of the advance of the main groupings. If a temporary switch to the defense is required, obstacle zones and fortified lines can be set up quickly in order for small forces to hold important axes on the exposed flanks or in areas with large gaps between the advancing groupings, as well as on a seacoast or in mountain passes, and in order to cover other important points.

Furthermore, during an offensive, units and large units of the ground forces may be delayed in front of continuous zones of strong radioactive and chemical contamination and enemy obstacles, in front of wide water obstacles if they do not manage an assault crossing of them from the march, and in several other instances. Rocket troops in siting areas, large command posts, units and subunits of ground forces in temporary concentration areas, reserves, units to be brought up to strength or get replacements, and troops in one-day rest areas, regardless of the generally high rates of advance, must for a certain period of time remain in one area and be subjected to the danger of enemy nuclear and chemical strikes. Consequently, the need arises to set up protected troop disposition areas in those places where they make stops of short duration.

We believe that everything that has been said indicates the need even during maneuver operations to set up a large number and various types of temporary multi-purpose fortified lines with obstacle zones, as well as protected disposition areas for the units and large units of the ground forces.

Naturally, when troops are in a relatively stationary position on fortified lines and in protected disposition areas, they are favorable targets for massed surprise enemy missile/nuclear strikes. From this it follows that ensuring troop survivability, a factor which greatly determines their combat effectiveness, presents under these conditions a difficult and

complex, but, in our view, completely solvable task. Sufficient attention is now being given to the problem of setting up siting areas for the rocket troops and of setting up large command posts. Many problems have been discussed in the pages of the Collections of the Journal "Military Thought", and, undoubtedly, the appropriate decisions have been made on a number of them.

But as concerns the motorized rifle and tank troops, we believe that the problem of ensuring their combat effectiveness and survivability in positions and areas of disposition has been very poorly worked out. Little attention has been given to this matter, since the opinion has developed that they possess high survivability. This can be explained by the fact that the motorized rifle and tank troops have a large number of armored vehicles that are highly resistant to the casualty-producing elements of nuclear bursts; they are very mobile, can disperse quickly, and can withdraw from under probable nuclear strikes. However, analysis shows that the degree of survivability of these troops when they are temporarily at positions and in disposition areas and are subjected to massed strikes by modern means of destruction is often overestimated.

Usually it is not taken into account that the continuous growth in the amount and variety of the yields of enemy nuclear warheads is leading to new forms of employing these weapons. It is known that, for an offensive operation, it has recently been proposed to allocate an average of more than 40 nuclear warheads for a US army corps, 150 for a field army, and 500 for an army group. In the initial period of a war, these norms can be increased considerably from the peacetime reserves. Furthermore, in order to hit the disposition areas of troops located in the depth, the new US Army manuals recommend the employment of thermonuclear warheads instead of nuclear warheads as being relatively cheaper and more effective.

Such views and the official positions of our enemies have led to a change in the forms of nuclear strikes. Recognized as realistic is the solid destruction of large areas occupied by troops by delivering a simultaneous strike with a large number of medium-yield nuclear warheads in such a manner that the radiuses of their zones of destruction are contiguous ("atomic carpet"), or by delivering a strike with two to three nuclear warheads with considerable radiuses of destruction against one large target

("nuclear mattress"). For example, according to US Army calculations, 12 to 15 air bursts of medium-yield nuclear warheads on a sector of 15 x 15 kilometers are sufficient to destroy completely a motorized rifle division that has hastily gone over to the defensive. The air burst of a thermonuclear warhead with a yield of one to three megatons gives a zone of continuous destruction of 300 to 400 square kilometers. This exceeds the total area of the dispersed disposition area of a motorized rifle division. It is recommended to use ground bursts to extensively create zones of radioactive contamination, which can result in considerable losses of personnel for a division that has hastily gone over to the defense. Moreover, the time needed to prepare to deliver massed nuclear strikes against a detected target is constantly decreasing and is now, according to American data, two to four hours.

The high vulnerability of motorized rifle troops to weapons of mass destruction when they quickly go over to the defense or briefly occupy a disposition area is due to the following causes: the large radiuses of damage to the existing types of armament and equipment resulting from the dynamic impact of the shock wave; the inadequate protection of personnel from penetrating radiation, radioactive dust, toxic agents, and bacteriological means; the impossibility of preparing dependable shelters in short periods of time (two to four hours); the difficulty of concealing disposition areas from the enemy; the limited capability of employing maneuver in a battle with an enemy who is superior in strength; the relatively low protective characteristics of dispersal and camouflage when there is solid destruction of large areas; the impossibility of completely covering troops with active means of protection against air strikes.

In most instances, the existing models of armament and military equipment, particularly those recently developed, cannot be employed for a lengthy period of time or repeatedly under conditions of the massed action of nuclear weapons. Usually not taken into account is the particular danger of equipment being put out of action by the dynamic impact of the shock wave. It is the dynamic impact -- which, as a result of reflection, produces a pressure much greater than on the shock wave front -- that causes armament and equipment to be hurled great distances and be put out of action. The radiuses of damage by the shock wave to

types of armament and equipment in exposed locations are as follows: in a burst of medium-yield nuclear warheads, more than 1,500 meters for armored personnel carriers, and 2,500 meters for motor vehicles; in a blast of megaton warheads, five and eight kilometers, respectively.

Nor is attention being given to the danger of personnel being injured by gamma radiation and radioactive dust. Even for tank crews, the radius of gamma radiation injury from the burst of a medium-yield nuclear warhead is approximately one kilometer.

During highly mobile actions, it is virtually impossible with the existing engineering methods and available forces to provide protection for the personnel, armament, and equipment of motorized rifle large units by the mass erection of dependable shelters in a short time (two to four hours). For example, the preparation of shelters just for the personnel of a division will require more than 5,000 cubic meters of lumber, hundreds of motor vehicles, and more than two days and nights of work. Three thousand cubic meters of earth have to be removed in digging the more than two thousand pits needed to shelter all the equipment and armament. This will require a large number of special earth-moving machines.

Open trenches cannot provide the necessary protection for armored personnel carriers and their crews, particularly against gamma radiation and radioactive dust. Also, it will often be impossible to shelter personnel separately in shelters away from the combat vehicles or equipment operated by them. Calculations show that when there are massed strikes, when the existing equipment has large damage radiuses, and when short periods of time are allocable for preparing positions, dispersal alone and the breaking up of a battle formation into small units cannot ensure the dependable survivability of a motorized rifle division. For example, in a massed strike of 20 to 25 medium-yield nuclear warheads against a newly established division defensive zone, the division may lose more than 50 percent of its personnel, 30 percent of its tanks, 50 percent of its armored personnel carriers, and more than 70 percent of its motor vehicles.

By employing various reconnaissance means, the enemy will be able to determine sufficiently well the disposition area of a

relatively stationary division battle formation. With solid enemy damage to large areas by means of nuclear weapons, even camouflaging the real positions and areas and setting up dummy ones will not produce the required effect.

One of the ways of protecting motorized rifle troops may be to maneuver them for the purpose of a frequent change in their positions or disposition areas. However, neither does this method, without the availability of highly stable positions and concentration areas when there are limited areas for maneuver, always produce the necessary result, if one further takes into account the possible large zones of radioactive contamination.

Thus, a comparison between the enemy capabilities of delivering nuclear and chemical strikes and the existing methods of protecting the troops permits the conclusion to be drawn that the latter cannot ensure preservation of dependable survivability of motorized rifle and tank troops who are located temporarily at positions and in disposition areas under conditions of high-maneuver actions with massed strikes by nuclear weapons.

In our view, the solution of this problem requires a basically different approach. Here the following measures are necessary: first, the adoption of a new method involving the rapid and repeated construction of fortified lines and protected troop disposition areas by means of rapid self-entrenching of previously reinforced and airtight bodies and hulls of existing combat and special transport vehicles (tanks, infantry combat vehicles, armored personnel carriers, missile launchers, the mobile control post vehicles, prime movers, etc.), which, when partially covered with earth, can be converted during stops into highly protected firing points or shelters that can be destroyed only when close to the ground zero of the burst; secondly, an increase in the stability (reinforcement) of the special types of armament and equipment (launchers, antennas, etc.) against the effect of the dynamic impact of the shock wave; thirdly, the unfailing integrated execution of all the technical measures listed above, together with the organizational measures for ensuring survivability (dispersal and breaking up of battle formations into small units, protective procedures, maneuver); fourthly, the carrying out of engineer protective measures (camouflage, the building of trenches and very simple shelters made from local and manufactured materials) and technical

measures for increasing survivability, the setting up of stable systems and means (of observation, communications, obstacles, etc.), and the setting up of a system of active means of protection.

It has been established from research carried out in the Military Engineering Academy that when the hulls and bodies of series-production vehicles (armored personnel carriers, infantry combat vehicles, tanks, prime movers, special vehicles) are somewhat reinforced and made airtight and when they are rapidly self-entrenched with a partial covering of earth, they can be converted at temporary stops into dependable shelters (see drawing page 15). When this is done, their survivability is sharply increased, since the radius of damage from the combined action of the air bursts of low- and medium-yield nuclear warheads is 50 to 200 meters. In this instance, a motorized rifle division will already be able within the first two to four hours after stopping to build dependable shelters against massed nuclear strikes. These shelters will include reinforced and airtight armored personnel carriers and infantry combat vehicles that have been dug in and partially covered with earth thrown over a plastic cover and that have a total capacity of 5,000 men. Four thousand men will be accommodated in the entrenched prime movers and special vehicles with reinforced airtight bodies; and tanks partially sheltered by sandbags will accommodate 1,000 men. In this way, it will not be necessary to stock several thousand cubic meters of lumber and to prepare structural elements, transport will not be necessary, and the manpower and machines required will be a little less than half of what is needed in building conventional shelters. The only requirement will be the preliminary expenditures for reinforcing the bodies of the existing series-production vehicles and making them airtight.

In view of the fact that they can be employed repeatedly and that fewer transport facilities, men, and machines are needed when preparing a fortified line in the proposed manner, the expenditures made to reinforce the bodies of the existing vehicles and make them airtight and to adapt them for conversion at stops into dependable shelters or fire positions are fully justified.

It presents some difficulty to ensure that all the indicated vehicles are dug in and covered with earth at lines or in areas

of disposition of a motorized rifle division in extremely short time periods (two to four hours), and often under enemy pressure. It is obviously not advisable in this instance to rely on high-performance earth-moving machines, since a great number of them will be required. The existing self-entrenching means of tanks, the BTU bulldozer blades, have serious shortcomings: they are cumbersome, heavy, and are carried separately on YAZ-214 trucks only over good roads.

The main method of preparing fortified lines will be the widespread self-entrenching of equipment, with the additional employment of a very limited number of special earth-moving machines. For this purpose, all tracked vehicles (tanks, prime movers) must have permanently attached light bulldozer blades, as well as drilling devices and authorized explosive charges calculated at 30 kilograms per pit. Under this condition, the time required for the self-entrenching of each vehicle will be not more than one to two hours. The self-entrenching of wheeled infantry combat vehicles, armored personnel carriers, and the digging of trenches near them for personnel must be done by a combination of means, by the employment of authorized explosive charges and a mechanized tool. According to the results of a number of tests, the models of such a tool have a productivity of up to 10 to 12 cubic meters of earth an hour. Moreover, once they get permanent earth-moving equipment, tanks will assist in the entrenching of the wheeled infantry combat vehicles and the armored personnel carriers when they are located together at company strongpoints.

In order to ensure the self-entrenching of subunits of the rocket troops and control posts, it is necessary to have also high-performance, protected earth-moving machines on a tank chassis. Detachments of these machines will usually be sent forward for the purpose of digging pits in advance. The existing earth-moving machines are not suitable for these purposes, since they are extremely vulnerable to missile/nuclear and conventional weapons, especially in a tactical zone.

To ensure rapid departure from under a partial earth covering, all the mentioned tracked vehicles use their tracks, while the wheeled vehicles are provided with very simple devices (winches, jacks). Tests carried out by the Military Engineering Academy have shown that by employing a number of measures, it is

possible to decrease the pull needed to get these vehicles out from under the covering.

The above methods and means ensure the massive and repeatable self-entrenchment of all the basic tracked and wheeled vehicles of a motorized rifle division which are to be converted at stops into firing points and shelters within two to four hours. Later on, if there is time and the forces and means are available and if the situation requires it, in addition to these improvised shelters and firing points, the fortified lines and protected troop disposition areas can be supplemented with shelters made from local materials and manufactured units.

An important method of reducing the radius of damage to military equipment is to reinforce it. Work done by the Military Engineering Academy in this area has shown that the employment of several simple elements for reinforcing the existing antennas, launchers, and other equipment, can cut their damage radiuses almost in half.

A sharp reduction of the damage radius by means of the rapid self-entrenching of the reinforced and airtight bodies of organic vehicles and an increase of the stability of the equipment ensure integrated effective employment of all the remaining methods of increasing survivability: dispersal, camouflage, maneuver, etc.

In order to destroy a reinforced, airtight, and entrenched armored personnel carrier and antitank guided missile launcher located 400 meters from one another -- a distance equal to two damage radiuses -- the enemy will need not less than one low-yield nuclear warhead for each one; and for the destruction of a company strongpoint, five to six of these warheads will be necessary.

When there is artillery preparation by the enemy (with a density of 50 to 100 rounds per hectare), the losses of a motorized rifle division on the defensive, as calculations show, may be no more than ten to 15 percent. Only the employment of several dozen low- and medium-yield warheads can succeed in driving a breach through a line fortified by such a method. This capability of rapidly setting up such strong shelters permits the more frequent maneuver of troops from one area to another.

Thus, the opportunity arises for the rapid formation and flexible construction of reinforced lines and protected troop disposition areas with a high degree of survivability during high maneuver actions.

However, in addition to stability against long-range fire, it is very important that the fortified line ensure the combat effectiveness, stability, and aggressiveness of the subunits and units in close combat. Here it is necessary to note the increase in the density and accuracy of fire of the enemy tanks, infantry combat vehicles, antitank guided missiles, and artillery, as well as the prospect of the future employment by the enemy of nuclear warheads with very low yields (0.2 to 0.4 kiloton). The employment of former means and methods to ensure the stability of the positions and to maintain the survivability of the fire means, equipment, and personnel of a motorized rifle division is also an exceptionally complex task.

In view of the danger that a large number of fire points may be put out of action by the aimed fire of the above means, it is necessary to provide for the erection in front of the fortified line of particularly strong and deep obstacles that are tied in with the fire plan, for an increase of the stability of the fire means themselves against direct fire, and for the capability of restoring the defense system of a given line. In our view, a motorized rifle division must set up the proposed fortified lines in the form of "pockets" and "traps" made up of obstacles and company strongpoints in order to delay the enemy and then destroy him by means of specially placed controlled nuclear or chemical high-explosive mines and missile strikes by request.

Blast-resistant controlled mines and mixed minefields placed by armored minelayers must be widely employed in the system of a fortified line. The general density of mining must increase sharply.

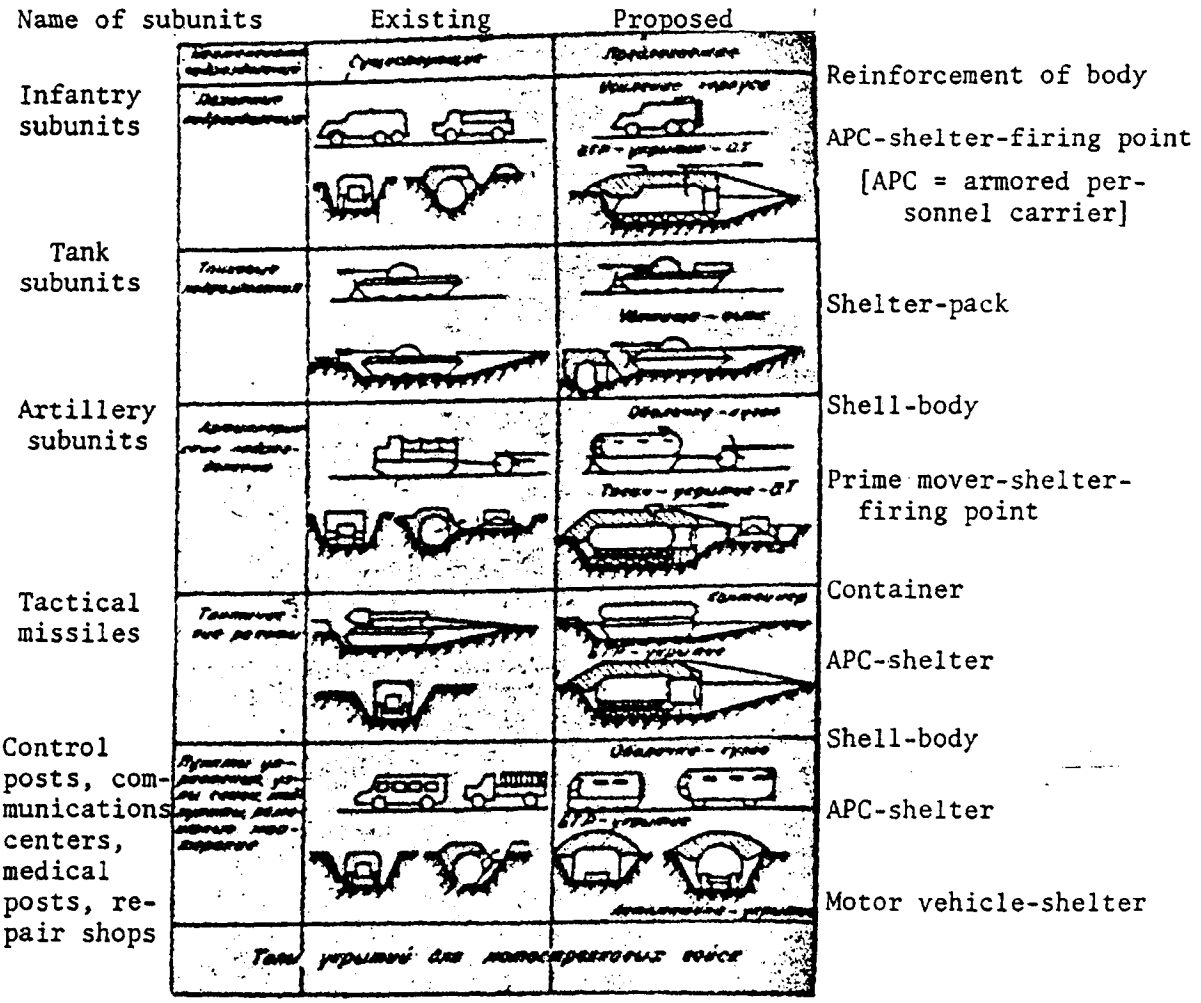
Of great importance for increasing the effectiveness and stability of the fire points, besides reinforcing the hulls themselves of the tanks, infantry combat vehicles, and armored personnel carriers, making them airtight, and adapting them for covering with dirt, are camouflage and concealment of the fire points along with the showing of false active (inflatable) mock-ups of fire points, micromaneuver, rapid replacement of

damaged fire points, and a definite method of fire. Calculations show that by carrying out all the enumerated measures, one fortified fire point with the proper observation means will be able to successfully withstand three or four attacking tanks. All this makes it possible to count on a sharp rise in the stability of reinforced lines of the motorized rifle and tank troops also in close combat.

Aggressive actions will be ensured in this instance by a combination of highly stable special positions and controlled obstacle zones with the maneuver of missile/nuclear fire, controlled nuclear mines, and reserves. In connection with the sharp change in combat methods and with the abundance among motorized rifle troops of new military equipment, particularly with the appearance of the infantry combat vehicle, there is apparently no longer a need to build an extensive continuous network of trenches and communication trenches, that is, purely infantry positions.

Forming the basis of rapid engineer preparation of the fortified lines and protected disposition areas of motorized rifle and tank troops under modern conditions will be the rapid self-entrenching of tanks, infantry combat vehicles, armored personnel carriers, armored prime movers, and special missile launchers with airtight reinforced bodies together with the digging of only a minimum number of trenches and communication trenches.

The method and means of rapidly erecting the fortified lines and protected disposition areas of motorized rifle and tank troops examined above will require experimental checking at exercises, the working out of organizational forms, and their consequent employment.



Types of shelters for motorized rifle troops

Figure. Types of shelters for motorized rifle troops.