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**CENTRAL INTELLIGENCE AGENCY**  
WASHINGTON, D.C. 20505

21 April 1975

MEMORANDUM FOR: The Director of Central Intelligence

SUBJECT : MILITARY THOUGHT (USSR): Ways of Increasing Efficiency in the Use of Motor Transport in Ground Forces Offensive 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 describes mechanization and the use of trailers and containers among ways to increase motor transport efficiency. The author recommends exchanging vehicle units and using a sector-relay system in place of the current through traffic method to deliver military cargo. This article appeared in Issue No. 2 (87) for 1969.

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

William E. Nelson  
Deputy Director for Operations

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## Intelligence Information Special Report

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COUNTRY USSR

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SUBJECT

MILITARY THOUGHT (USSR): Ways of Increasing Efficiency in the Use of Motor Transport in Ground Forces Offensive Operations

SOURCE Documentary

Summary:

The following report is a translation from Russian of an article which appeared in Issue No. 2 (87) for 1969 of the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal 'Military Thought'. The author of this article is Colonel N. Malyugin. This article suggests measures for increasing motor transport efficiency, including exchanging entire military transport units, reducing materiel transshipments and paperwork, using trailers, and introducing relief drivers and a sector-relay system to replace the through traffic method. The author stresses the importance of mechanizing loading-unloading operations and document processing, and coordinating shipments to save time; he suggests that transport capacity could be increased inexpensively by modifying existing trucks. The advantages of container shipments currently are offset by inadequate technology, but pallets could be used more extensively.

End of Summary

Comment:

N. Malyugin has been identified as the author of several articles in various military publications concerning topics of logistical support in military operations. 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.

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Ways of Increasing Efficiency in the Use of Motor Transport  
in Ground Forces Offensive Operations

by

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Candidate of Military Sciences

The successful conduct of combat operations in modern war is known to depend decisively on the ability of the rear services to provide the troops with needed materiel in a timely manner. The increased volume of shipments and the task of uninterrupted delivery of missiles, missile propellant, ammunition, fuel, and tank, vehicle-tractor and other types of military equipment directly to the battlefield, require the combined and efficient use of all types of transport available in the theater of military operations. However, motor transport will be the main means in the front, army, and tactical rear services for delivering cargo to the troops.

A motor vehicle, because of its universality of use, comparatively large cargo capacity, its viability, maneuverability, and ease of control, has become the most-used transport means of the ground forces. It also serves as a connecting link between all types of modern transport and makes them function normally. Suffice it to say, for example, that up to 75 percent of all cargo is shipped by motor vehicles before being loaded onto other types of transport.

Consequently, the solution of most of the problems of military transport support in ground forces offensive operations will to a large extent depend on the successful operation of motor transport, and on the degree to which the potential capabilities inherent in each motor vehicle are utilized.

A great deal of experience in the operation of motor transport was gained in the postwar period, but, unfortunately, the shortcomings of the past war still persist. Thus, the most progressive methods of organizing transportation and the most economical types of military cargo shipments still are not used extensively, the experience of organizing mass shipments in the national economy has not been studied enough, too much of the loading and unloading still is being done by hand, etc.

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Since the level of materiel support to the troops is greatly dependent on the capabilities of motor transport, it has become necessary to investigate and implement various organizational-technical measures aimed at increasing efficiency in the use of each motor vehicle, as well as of the subunits, units, and large units of the motor transport troops.

When we take into account the possible nature of an offensive battle and operation in a future war, the level of technical equipment of the troops and rear services, and also the immediate prospects for the economic development of the national economy of our country, even now we can determine which organizational-technical measures, when implemented, will make it possible to increase motor transport performance considerably. The basic measures are: exchanging delivery motor transport; reducing the number of transshipments of materiel when delivering it to the troops; reducing the time needed to draw up the accompanying documentation; using trailers, semitrailers, and tractor-trailers; bringing a second set of drivers into the T/O of motor vehicle units; introducing a sector method of movement using a driver relay system; mechanizing loading-unloading operations; using container and package shipments; increasing the motor vehicle cargo capacity coefficient; coordinating the operation of different types of transport at their junction points; completely equipping bases and depots with mechanized means of accounting and processing documents.

Let us examine each of these measures in detail.

Exchanging delivery motor transport. Currently, because of the uniformity of motor vehicles in the front, army, and partially also in the tactical rear services, there is a real possibility of exchanging them at the junction of the combined levels of delivery, especially when delivering materiel not requiring any additional sorting and preparation (fuel, and most ammunition, engineer, armor and other types of equipment). Some attempts to solve this problem already have been made. Thus, the Operational Rear Services Manual (part 2, page 307) recommends exchanging trailers when turning over cargo. In initial offensive operations, however, when the time element will be of decisive significance, this is simply not enough. With the small number of trailers available in the front truck battalions, exchanging only the trailers will not reduce loading-unloading operations very much, and will speed up cargo delivery only slightly. Besides, this kind of exchange will make it impossible to identify the cargo and trailers.

This means that in an initial offensive operation it will be necessary to carry out a mass exchange not only of trailers but also of motor

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vehicles in organic subunit strength (no smaller than platoon). In this case the organizational integrity of the subunits is maintained, as is the identity of the cargo, and the responsibility of the drivers for the cargo being delivered is increased. In addition, by using this type of exchange, transshipments and the massing of motor vehicles at the transfer points may be avoided, and the length of time the transport is idle may be reduced considerably. For example, an exchange of company-size convoys could save 250 to 300 man-hours and increase the productive operating time of the vehicles by at least 1.5 hours; and an exchange of front motor transport (within limits of up to 25 percent) with that of an army would result in a saving equal to the input of an additional motor transport battalion of trucks and would reduce the manpower requirement by 2.5 to 3 thousand men daily.

To increase the responsibility for the use of the exchanged subunits, the exchange should be formalized by a standard document -- an exchange certificate, which includes operational accounting information: the number of personnel and vehicles (trailers, semitrailers), their general technical condition (in good repair, out of order), and the total radiation dose of the personnel. The fuel and food supply situation is calculated from the initial documents. The exchange certificate is prepared in three copies and is signed by the chiefs of the motor vehicle convoys (subunits) who were given approval for the exchange, or by representatives of the appropriate echelons of the rear services. Each of the subunits conducting the exchange receives one copy, and the third copy goes to the planning transport organ to monitor motor transport utilization.

The motor transport received in exchange must be operationally subordinate to the commanders of the units whose vehicles were involved in the exchange.

Reducing the number of transshipments of materiel when delivering it to the troops. During offensive operations in World War II, ammunition frequently was delivered by front motor transport to the division and even regiment depots (bypassing the army depots), and sometimes even to the artillery and tank fire positions; army and division transport in turn delivered it directly to the battlefield. All this made it possible to eliminate one or two transshipments and, by the same token, release manpower, speed up the delivery of the ammunition, and increase the daily run of the motor vehicles. For example, during the preparation of the Belorussian operation, the 18th Motor Transport Regiment of the 3rd Belorussian Front delivered ammunition to the division and regiment depots of the 31st Army troops, and the 115th and 577th Motor Transport Battalions

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delivered to the artillery fire positions of the 36th and 71st Rifle Corps large units.\*

In an initial offensive operation, in view of the large volume of shipments, the shortage of transport and loading and unloading means, and also the limited time for carrying out the shipments and the difficult conditions for delivery, the number of transshipments of the bulkiest cargo (fuel, ammunition and others) must be reduced considerably.

Currently, under the existing procedure for the passage of materiel from the front regulating station to a battalion (division, company), most of the cargo is transferred from transport to transport, and moved at the warehouses, up to 9 to 12 times. To handle such a volume of work at all the delivery levels, will require up to 10 to 15 thousand men and a great deal of time.

What, then, are the possibilities of reducing the number of transshipments? Calculations show that up to 50 percent of the shipments can be sent to the troops from the front depots and their branches without being transshipped at the army and division depots. In most cases the number of transshipments of materiel depends on the specific situation developing, on the transport capabilities of the front, and on the availability of loading and unloading means. However, eliminating only a single transshipment operation (out of 9 to 12) reduces the volume of loading-unloading operations by an average of 10 to 12 percent per day, releases at least 1000 to 1200 men, speeds up the delivery of cargo by 2 to 4 hours, and increases the daily run of the motor vehicles by 50 to 100 kilometers.

Reducing the time needed to draw up the accompanying documentation. The existing procedure for drawing up documents to be given to the cargo dispatchers increases the idle time of transport vehicles being loaded almost twofold. In accordance with the Instruction covering the work of motor transport delivery large units and units (pages 57, 63), the staff of the motor transport unit issues the motor transport convoy an itinerary on which the cargo being shipped is noted after loading, copies of the orders (manifests), and a consignee receipt list covering each vehicle. Thus, a company-size motor transport convoy with 72 vehicles has to have 72 consignee receipt lists drawn up and issued to it under field conditions. However, since in most cases the cargo is released by the same persons who drew up the consignee receipt lists, the latter can be drawn up only after the loading has been completed. Also, it is virtually impossible to draw

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\*Archives of the Ministry of Defense of the USSR, Section 241, Opus 2634, File 24, Pages 5-7.

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up consignee receipt lists beforehand when mass shipments are being made and the situation is changing rapidly, because it is not known which vehicle will be loaded next and how much cargo will be loaded on it.

Experience shows that drawing up documents for just one company actually takes up to 70 to 110 minutes. During World War II even additional time was allotted for these purposes: the idle time of a company-size motor transport convoy for loading, including drawing up the necessary documentation, increased from 1 hour to 2 hours in the daytime and from an hour and a half to 4 hours at night. Under modern conditions, using that much time for auxiliary operations can nullify all the advantages of employing means of mechanizing loading-unloading operations.

As is known, the consignee receipt list was introduced by Order No. 0169, 1942, of the Peoples Commissariat of Defense of the USSR, for the purpose of ensuring the security of shipments and increasing the responsibility of the driver for the materiel valuables being transported. In the war this order played a positive role. At the present time, considering the increased degree of conscientiousness of each Soviet soldier, as well as the fact that all the shipments in the front and army rear services are made basically by organic subunits, it is desirable to draw up a consignee receipt list for a platoon, turning the responsibility for the cargo over to its commander, especially when fuel, ammunition, engineer and other equipment in standard packaging are being shipped. This will reduce the time for drawing up consignee receipt lists by a factor of more than 20 (the number of vehicles in the platoon) and reduce the amount of secondary accounting documents being made out at the front depots by 8 to 14 thousand copies per day. When necessary, the platoon consignee receipt lists can indicate the cargo loaded in each vehicle, for which purpose a special form for listing cargo carried by the platoon is provided on the other side of the list, where the driver signs for receiving the cargo. With this arrangement the platoon commander always has a chance to check the presence and condition of the cargo. The procedure for filling out the consignee receipt lists for single items and very important cargo must remain unchanged.

The use of trailers and semitrailers. Delivery conditions in the front rear area (especially with the presence of a dense highway network in the Western Theater of Military Operations) permit the extensive use of the entire vehicle pool with trailers and semitrailers. Therefore, it is possible to increase the cargo capacity of each transportation unit by 50 to 75 percent, reduce the total number of personnel and vehicles, shorten a motor transport convoy by 25 to 50 percent, and thus relieve the pressure

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on front roads.

Possibilities of resupplying the troops by trailers already exist, since by the end of 1968 the number of them in the national economy had risen to 8 percent of the total number of vehicles (it doubled in comparison with 1960), and at the present time industrial enterprises are continuing to increase the production of trailers.

Cargo shipments by tractor-trailers recently have become quite widespread in the Soviet Union and abroad. Using them reduces the basic cost of shipment by 20 to 25 percent and raises the productivity of the transport by an average of 60 percent. Shipments by tractor-trailers now have been organized in all economic regions of the country. Over 7,000 tractor-trailers move along more than 500 routes every day. Preference is given to tractor trucks with semitrailers because of their large cargo capacity and high speeds. For this reason, when motor transport troops are organized en masse at the beginning of a war, a large-scale influx of tractor trucks into the front rear services must be expected.

In modern offensive operations, tractor-trailers, as a powerful and stable transport means, will be used extensively when the operation of the railroads in the front rear services zone is disrupted, especially in these delivery sectors: rear front base to forward front base (its branch), and forward front base to mobile army base.

Bringing a second set of drivers into the T/O of motor transport units. In the past war a driver at the normal level of motor vehicle use worked 6 to 10 hours, and under pressure, 12 to 14 hours per day. But after 4 or 5 days of such strain the rate of deliveries fell sharply and the number of minor and major accidents due to driver fatigue increased several times. Therefore it became necessary to provide time for the personnel to rest and for technical servicing of the vehicles.

At the beginning of World War II there were two drivers to each vehicle in the motor transport units. This made it possible to use the transport 20 to 22 hours per day. In April 1942 the second driver was eliminated, which left one alternate driver for every two vehicles. This arrangement continued until the end of the war without any significant changes.

Under modern conditions, introducing a second set of drivers, in our opinion, will be the most desirable and economical method of increasing the efficiency of motor transport operations (compared to organizing additional

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motor transport units), and will make it possible to sharply increase the performance of each vehicle and bring its daily run up to 400 to 450 kilometers, establish a necessary reserve of drivers for emergency replacement of the casualties from working in zones of radioactive contamination, and employ the sector method of movement using a driver relay system.

The above-mentioned problem already has been partially solved, and two drivers per transport have been planned for some motor transport brigades. There is a special need for second drivers now on tanker motor transport. But at the same time, the question naturally arises in all elements of the rear services as to how the motor transport units having two drivers per vehicle should be used. For example, when organizing through traffic, while the daily run of the transport is increased considerably with two drivers, when they are both in the cab while operating in a zone of radioactive contamination, they may be incapacitated simultaneously. Besides, it still is not possible to provide even the minimal conditions for the second driver to rest while on the move in the vehicles which have been supplied to the troops.

The above shortcomings can be eliminated if the traffic is organized by the sector method, using a driver relay system. In this case the drivers are distributed by route sectors and replace each other at the transport exchange points (meeting points). This way personnel losses are reduced when operating in contaminated zones, and better conditions are created for the drivers to rest, while the motor transport unit command always has the necessary reserve of drivers in one place.

Introducing a sector method of movement using a driver relay system.  
All the methods of motor transport movement currently used in the front rear services are of the so-called through traffic type, wherein the driver delivers cargo in his assigned vehicle from the loading point to the unloading point. However, in long distance shipments, usually after the second half of a day's trip, as a result of the increase of delays associated with the run, the drivers resting enroute, and the servicing of the vehicles, the performance of the latter begins to diminish. Calculations have shown that, in shipping cargo a distance of 600 kilometers, in the case of through traffic these delays require at least 10 to 12 hours. Therefore, the reduction of unproductive time losses enroute is one of the decisive conditions for increasing efficiency in the use of transport and for reducing delivery time.

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The essence of the sector method of movement, using a driver relay system, is that the entire route is divided into sectors, with each transport or driver working a particular sector, and the materiel is transferred from one sector to the next without transshipment (in trailers, containers, semitrailers or trucks) in accordance with the accompanying documents. Due to the reduction of vehicle idle time enroute when the sector method of movement is used, the time for delivering the cargo to the troops is sharply reduced. Graphic estimates indicate that cargo shipped 600 kilometers by the through traffic method will reach the recipient in 37 hours, and in 28 hours when shipped by the sector method.

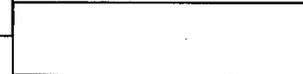
Because of the use of tractor-trailers and the doubling of driver strength, realistic conditions will be created for organizing the sector method of movement with a driver relay system. In the front rear services, with a comparatively constant and regular long-distance cargo flow (especially when a subsequent task is being carried out), this method of movement will provide important advantages, compared to through traffic: it will reduce the time of cargo deliveries (by 20 to 30 percent) and the volume of loading-unloading operations; it will increase the motor transport daily run (up to 500 to 600 kilometers); and it will reduce total shipping costs.

Mechanizing loading-unloading operations. The experience of World War II has shown that the idle time of motor transport during loading (unloading) was 10 to 15 percent of the utilization time of a vehicle at the front - army level, and 30 to 40 percent at the army - division level. Because of the shortage of manpower and the almost total lack of the necessary means of mechanizing loading-unloading operations at the loading (unloading) points, the motor transport often was detained for loading (unloading) longer than the designated amount of time. In a number of cases, the unloading had to be organized by using the drivers, which led to a longer idle time of the vehicles, reduction of the efficiency of the drivers, and an increase in accidents on the roads. Thus, the front motor transport of the 1st Belorussian Front in a seven-month period of 1944 (January to July) had above-normal idle time of 12,011 vehicle-days,\* and the 10th Motor Transport Brigade of the 3rd Belorussian Front in only five days (from 14 to 19 February 1944) was detained for loading (unloading)

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\*Ministry of Defense Archives, Section 233, Opus 2366, File 45, Pages 73-82, 221-224.

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4349 vehicle-hours over the established norms, and in the process some platoon to company-size convoys took 12 to 15 hours each to load.\*

Under modern conditions it is impossible to carry out motor transport shipments without the extensive use of the means of mechanizing loading-unloading operations and the proper organization of them. At present, when it is assumed that extensive use will be made of large-capacity trucks, tractor-trailers, trailers, containers and pallets for shipment, the total mechanization of loading-unloading operations becomes especially important. And yet, analysis of the equipment tables of servicing units and subunits and of front depots shows that the means of mechanization available in them, as far as their performance is concerned, do not ensure processing all of the cargo, as most of these means are of the semi-stationary type. As before, a considerable amount of the work is done by using manual labor.

Shipments in a front offensive operation will be characterized by a large volume of work, limited time for completing it, considerable dispersal of loading and unloading points, frequent relocation of depots and their branches, and by unstable cargo flows which change suddenly in size and nature. Therefore, the means of mechanizing loading-unloading operations must have: the capability of moving independently at speeds equal to those of motor vehicles; high performance; autonomy and independence from outside power sources; and universality, i.e., these means must have the capability of loading and unloading all types of cargo.

Of the currently available means of mechanizing loading-unloading operations, only the vehicle-mounted cranes and hydraulic cranes meet the above requirements; but there are very few of them in the servicing units and subunits. Nor do the front and army motor transport delivery units have such means. Recently, the number of motor vehicles with hydraulic cranes in the national economy had increased considerably, and, of course, at the beginning of a war they will be turned over to the troops. Therefore, motor vehicles with hydraulic cranes should be included in motor transport battalions (on the basis of three units to a motor transport platoon); this will considerably reduce the idle time of transport for loading (unloading), and it will release a large number of personnel. This also may serve as the beginning of the centralization of all mobile loading-unloading means under a single transport organ responsible for shipments.

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\*Ministry of Defense Archives, Section 241, Opus 2634, File 24, Pages 10-12.

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The experience of organizing centralized shipments in the national economy has demonstrated the desirability of concentrating mobile loading-unloading means in motor transport enterprises. This approach is not without foundation: as long as the transportation process includes loading and unloading operations, the means of performing them must be subordinated to those who make the shipments and are responsible for completing them. Currently in the operational rear services the responsibility for loading-unloading operations rests with the chiefs of the front bases and depots, i.e., persons who have neither the moral nor material responsibility for the proper utilization of motor transport. This undoubtedly can affect the performance of transport at the beginning of a war.

The use of container and package shipments. One of the important measures for increasing the performance of motor transport and speeding up the delivery of materiel to the troops is the use of container and package shipments in the operational rear services. These types of shipments are used extensively in both the Soviet Union and Western European countries. Container shipments have a number of advantages over conventional ones. They lower the cost of the loading-unloading operations by a factor of more than 3, reduce the loading (unloading) time by a factor of 3 to 5, speed up the turn-around of transportation by 40 to 50 percent, provide better protection of cargo from precipitation and theft, considerably reduce the number of storage facilities, and cut packing material expenses in half. The use of containers under combat conditions, in addition to improving transportation support, helps to reduce contamination of materiel by radioactive substances (by a factor of 2 to 3), and ensures the safety of cargo under field conditions.

These advantages of using containers are the reason that a considerable volume of container shipments are made not only by rail and water, but also by motor and even air transport. The container stock of our motor and railroad transportation currently amounts to approximately 1.5 million containers (in the 2.5 ton range). Industry produces about 20 types of all-purpose and several tens of specialized containers (for specific types of cargo).

The US armed forces command is using containers extensively to support its troops in Vietnam. It has been reported in the American press that over 3 thousand containers of various cargo capacities are shipped to Vietnam monthly, and that in most cases they are loaded at the warehouses of the supplier-manufacturers and at central supply bases.

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The availability of a considerable stock of containers in our country and the highly tangible advantages of using them have established the practical prerequisites for the mass introduction of the container method of shipment under army conditions in both peace and war. However, extensive utilization of containers is impeded by a number of organizational entanglements and unresolved technical problems. A single technical policy on the development of the needed types of containers still has not been implemented. The armed forces lack a coordinating organ concerned with the supply of containers to the troops, and with the development and planned introduction of container shipments not only in the operational, but also in the tactical rear services.

The development of air and motor transport cargo shipments and the need to supply remote garrisons require the introduction of light and portable collapsible containers made of plastic material, pressed cardboard, or rubberized fabrics.

The broad introduction of container shipments is hampered also by the fact that there is a shortage of hoisting equipment at many loading and unloading points; there are not enough container platforms in railroad and water transportation, and almost none at all in motor transport. Because of the inadequate study of the nature and magnitude of cargo flows and the lack of continuity in container shipments, the empty containers in many cases are not used on the return trips and additional transportation has to be assigned to carry them back.

Along with containers, package shipments recently have been used on a large scale in our country and abroad. The package method of transporting cargo consists of combining crated or uncrated articles into a consolidated lot-package by means of a special structure - a pallet. When this shipping method is used, all cargo loading, unloading, and shifting operations are carried out without rearranging the package, right up until it is turned over to the recipient.

Piece cargo consisting of the same kind of items, whose dimensions insofar as possible must correspond to the size of the pallet, is required to make up a package. The packages may be formed both manually and by conveyors or by other equipment used for continuous feeding of cargo. In a number of enterprises in the country, all package assembly operations now are carried out by high-performance automatic or semi-automatic package forming equipment.

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Several types of pallets of different dimensions and design are manufactured by industry. The basic type intended for extensive use in both regular motor transport shipments and mixed shipments is the double pallet which can be approached from four sides in sizes of 800 x 1200, 1000 x 1200, and 1200 x 1600 millimeters.

The package shipping method has considerable advantages in comparison to conventional shipments. First of all, the costs of loading-unloading operations are considerably lower. With manual loading (unloading), the basic cost of a one ton operation is 40 kopeks, and 10 kopeks with partial mechanization, but with package shipments it is 3 kopeks. The time required for loading and unloading operations also is reduced substantially. For example, loading a ZIL-164-type motor vehicle with piece cargo weighing 50 kilograms per piece, using an automatic loader, will require 60 to 90 minutes, whereas loading packages on the same motor vehicle will take only 6 to 9 minutes. Using the package shipping method ensures better protection for cargo in transportation and in storage. The pallets can serve as storage inventory when storing materiel.

In view of the fact that the recovery and repair of pallets requires additional expenditures, both here and abroad more durable and lightweight materials recently have been sought for their manufacture. Because of this, tubular pallets made of aluminum and its alloys, as well as of plastic material, have begun to come into use. One-time pallets (made of paper or cardboard) are being used more frequently.

The experience of organizing shipments in our national economy, the availability of pallets, their ease of manufacture, and the possibility of packaging basic crated and piece military cargo, allow package shipments to be made on a large scale in delivering materiel in the tactical as well as in the operational rear services.

Increasing the coefficient of motor vehicle cargo capacity utilization. The trucks now being produced in series in our country have beds which are not large enough, and low sides, and as a consequence, when carrying most cargo their capacity is not fully utilized. The coefficient of utilization of the area of the bed, because of a lack of standardization of crate dimensions, does not exceed 0.6 to 0.9; this being the case, the cargo capacity coefficient of the trucks is reduced to 0.7 and 0.8, and for some types of materiel even to 0.4 to 0.5.

The experience of shipments in the last war, and the postwar operation of motor transport, show that with certain additional equipment for motor

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vehicles the cargo capacity utilization coefficient of each vehicle can be considerably increased. Thus, during the period of preparation for the Belorussian operation, in the 3rd Belorussian Front the cargo capacity of the front motor transport was increased by an average of 15 percent by building up the sides of the truck bodies, which was equivalent to adding another 1.5 motor transport battalions. The importance of such measures has not lost its significance even now. With a low expenditure for additional equipment the coefficient of motor vehicle cargo capacity utilization may be increased 10 to 20 percent, depending on the type of cargo. The motor vehicles should be completely equipped still in peacetime both in motor transport units and subunits, and in the vehicle servicing facilities of civilian departments.

Coordinating the operation of different types of transport at their junction points. When a shipment is being made there is a constant transfer of materiel from one type of transport to another at their junction points. In the front rear area, these points include railroad stations, ports, docks, materiel support airfields, temporary transshipment areas or specially designated materiel transfer points, pipeline terminal points, etc. To avoid congestion of rolling stock and materiel and also to reduce the volume of loading-unloading operations right at the transport junction points, as a rule the cargo is only transferred from one transport to another without laying it on the ground. This requires exact coordination of the cooperating types of transport in terms of both timing and cargo capacity.

Thus, for example, if a freight train of a certain weight is brought to an unloading station, an appropriate number of motor vehicles and the necessary loading-unloading means to ensure receiving the cargo within a set time without laying it on the ground, must be brought to the station at the same time in order to avoid idle time.

When organizing the delivery of materiel, measures should be planned to ensure the coordinated operation of the different types of transport, especially rail and motor transport. These measures are, first of all: the timely arrival of the transport; the assignment of the necessary number of motor vehicles, personnel and means of mechanization; the preparation of access roads; traffic control; the preparation of the loading (unloading) site; the organization of air defense, protection, defense and security measures; and a control and communications procedure. The implementation of these measures requires that a special document - a coordination timetable -- be prepared, and that the basic data be included in the shipping plans according to the type of transport.

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The continuous implementation of regulating measures while the shipments are in progress makes it possible to avoid transport idle time at the junction points, to sharply reduce the volume and time of the loading-unloading operations, and, by the same token, to reduce the losses of materiel due to the effects of nuclear weapons and aviation.

Completely equipping bases and depots with the means of automating and mechanizing accounting and document processing. The experience of war has shown that the supply services and the rear area must always have information regarding the availability and nomenclature of the materiel at their disposal. With the stable condition of front depots and army bases, and the comparatively small volume of shipments during the years of the past war, the accounting organization basically satisfied requirements. In modern war the cargo turnover of each depot and base will sharply increase, the time for receiving and releasing cargo will be reduced, and the mobility of the depots and bases will increase (most of them will be on wheels). In addition, the amount of cargo released will fluctuate sharply, for example, when second-echelon troops are moved forward, when the same types of depots and bases are destroyed, etc.

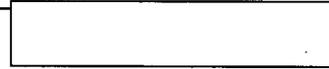
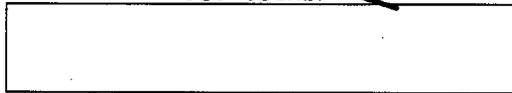
This characteristic of the operation of the depots and bases will of course complicate processing the enormous amount of inquiry-information and accounting documentation, and the supply services will not be able to make timely issue of the basic data needed for planning by the rear services command. Calculations show that with the existing accounting equipment and personnel, accurate basic information on the presence of materiel in one front base and its branch can be obtained in not less than 10 to 12 hours, whereas the situation will require that the information be made available in 1 or 2 hours at the most.

For this reason the front and army depots must have computers for receiving and processing the numerous requisitions submitted by the troops in a short time, and for determining the degree to which the requisitions have been fulfilled.

These are possible ways and methods of increasing efficiency in the use of ground forces motor transport and speeding up the delivery of materiel to the immediate user on the battlefield. Putting the majority of these organizational-technical measures into practice will not require large financial and materiel expenditures, and is feasible even now. The

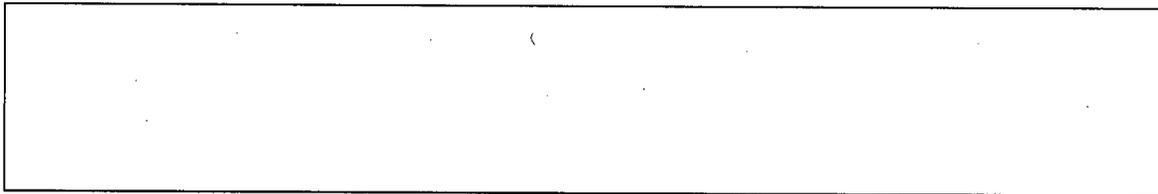
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question of when and which particular measure must be implemented when delivering materiel via motor transport in Ground Forces offensive operations, must be carefully worked out and determined still in peacetime, and after the beginning of a war the measure must be only partially adjusted to suit the developing strategic situation.



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