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CENTRAL INTELLIGENCE AGENCY
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MEMORANDUM FOR: The Director of Central Intelligence

FROM : Theodore G. Shackley
Acting Deputy Director for Operations

SUBJECT : MILITARY THOUGHT (USSR): Engineer Support of the Assault Crossing of Water Obstacles on a Coastal Axis

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 presents comparative data on the inadequate capabilities of divisions to negotiate water obstacles with the existing organization of engineer units, and the increased rates achieved in exercises in the Baltic Military District through the implementation of a new organization for combat engineer troops and the supplying of them with various types of amphibious and river-crossing equipment. The authors also discuss the procedure for making assault crossings, the allocation and tasks of forward detachments, the maneuvering of crossing equipment from one obstacle to another, and the allocation of front, army, and local equipment for reinforcement. Also the value of building low-level wooden bridges is emphasized, and data on the capabilities of engineer troops to do this are provided. This article appeared in Issue No. 3 (79) for 1966.

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

Theodore G. Shackley

[redacted]

[redacted]

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SUBJECT

MILITARY THOUGHT (USSR): Engineer Support of the Assault Crossing of Water Obstacles on a Coastal Axis

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Summary:

The following report is a translation from Russian of an article which appeared in Issue No. 3 (79) for 1966 of the SECRET USSR Ministry of Defense publication Collection of Articles of the Journal "Military Thought". The authors of this article are Colonel F. Myshak and Lieutenant Colonel A. Lavrus. This article presents comparative data on the inadequate capabilities of divisions to negotiate water obstacles with the existing organization of engineer units, and the increased rates achieved in exercises in the Baltic Military District through the implementation of a new organization for combat engineer troops and the supplying of them with various types of amphibious and river-crossing equipment. The authors also discuss the procedure for making assault crossings, the allocation and tasks of forward detachments, the maneuvering of crossing equipment from one obstacle to another, and the allocation of front, army, and local equipment for reinforcement. Also the value of building low-level wooden bridges is emphasized, and data on the capabilities of engineer troops to do this are provided.

End of Summary

[redacted] Comment:

Colonel F. Myshak also wrote "Some Problems of Engineer Support to an Antilanding Defense" in Issue No. 2 (81) for 1967 [redacted]. 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]

[redacted]

Engineer Support of the Assault Crossing of Water Obstacles on a Coastal Axis

(Based on the experience of command-staff and troop exercises of the Baltic Military District)

by

Colonel F. MYSHAK
Lieutenant Colonel A. LAVRUS

On a coastal axis the rivers branch off extensively in the estuarial areas; they are very wide and deep, have marshy approaches and are enclosed by dikes. The water level in them is not constant. It varies under the influence of sea tides, floods and winds. Because of this the rivers overflow their banks and inundate the floodplains across which trestle bridges must be built as well as crossings over the dikes. The extensively developed network of very wide and deep navigation channels, together with embankments rising as much as three meters above the surface of the water and reinforced with a rock apron, make the use of amphibious crossing means very difficult.

If nuclear weapons are employed and the dams of water reservoirs are destroyed, a catastrophic flood results, and the assault crossing of the rivers over a considerable portion of their length becomes impossible. After the water subsides, the floodplain is transformed into extremely marshy terrain, and a great deal of work is required to build roads and cross-country routes.

The bursts of nuclear warheads directly in the river bed also make crossing more difficult. The ridge of the crater of nuclear bursts of very high yield causes a peculiar twin dam, even in small rivers. Depending on the rate of flow and volume of water, after the first hours or days a water reservoir is formed that can be dozens of kilometers long, which makes an assault crossing by troops difficult. During the time the reservoir and the crater below it are filling up, the river bed becomes shallower from silting. This facilitates the crossing of troops. However, the gradual erosion of the crater ridge on the high side and subsequent filling on the low side lead to flooding with a high rise in the water level and a fast

rate of flow. In this case a crossing is impossible.

Consequently, until the river returns to its normal state, the main method of crossing by troops must be the assault crossing by ferries. The rigging of floating bridges and construction of low-level bridges, and the driving of tanks on the river bottom, are out of the question during this period because of the abrupt and unforeseen fluctuations in the water level and rate of flow.

It must be taken into account that the water will be radioactively contaminated as a result of the nuclear burst. Special measures must be taken to protect the personnel of the subunits which are supporting the crossing of troops below the site of the nuclear burst.

In addition to the above enumerated conditions, the nature of the defense of the water obstacles also has an effect on the organization of engineer support of the assault crossing of rivers. According to the experience of NATO exercises which were conducted from 1957 to 1965, the defense relied heavily on a widely developed network of rivers and canals. Areas suitable for an assault crossing were covered by a system of artificial obstacles constructed by engineers on the banks and in the river beds. The formation of flooding zones, the release of water from reservoirs, an abrupt change in the state of rivers as a result of the explosion of nuclear land mines, etc., were foreseen. All large bridges, dams, and ferries, as a rule, were prepared for demolition.

Under these conditions a successful assault crossing of water obstacles is possible through the skilful and timely maneuvering of water-crossing means, which is achieved by means of the centralized control of these means. The solution of this problem largely depends on the availability in the troops and authorized purpose of the water-crossing means.

Thus, with the existing organization of the engineer subunits and the supplying of them with engineer equipment, motorized rifle and tank regiments are virtually incapable of solving the main problems of engineer support of the assault crossing of rivers. The regiments need reinforcement. The capabilities of the divisions are likewise insufficient.

On the basis of our calculations, we can give, as an example, some data on the capabilities of troops to negotiate water obstacles 200 meters wide. In particular, a motorized rifle division at full strength, with

organic equipment alone (without the crossing of tanks along the bottom) can be taken across in 37 hours; if it is reinforced with a GSM tracked self-propelled ferry platoon and a PTS-type amphibian platoon it can be taken across in 23 hours; if it is reinforced with a pontoon company having one-half of a PMP pontoon bridge park, a tracked self-propelled ferry platoon, and a PTS-type amphibian platoon it can be taken across in 16 hours. Under the same conditions the main forces of the division can be taken across much more quickly, in 10.4 and 2.5 hours, respectively.

An army at full strength can be taken across in 16 hours in organic equipment, including three divisions of the first echelon in eight hours. In this case each division of the first echelon can be reinforced with the above-indicated equipment. If, however, there are only two divisions in the first echelon of the army, they can be taken across in four to six hours. If the army is reinforced with a pontoon-bridge regiment and an amphibious crossing battalion, all of the troops of the army can be taken across in 12 to 13 hours, and the divisions of the first echelon in four hours. For the suitable reinforcement of the armies and divisions, and for setting up the necessary reserve, the front must have two or three pontoon-bridge regiments and one or two amphibious crossing battalions.

The front and army river-crossing equipment generally satisfies present-day requirements in both quantity and quality, which cannot be said of the equipment of the divisions.

In the troops of the Baltic Military District in the summer of 1965 a new organization was tested for a separate combat engineer battalion of a division with half of a pontoon bridge park, a tracked self-propelled ferry platoon, a PTS-type amphibian platoon and two TMM heavy mechanized bridge sets. The division, fitted out with this equipment, demonstrated high capability of negotiating water obstacles in many exercises. The troops made assault crossings of rivers up to 120 meters in width at a rate practically equal to that of the advance. These exercises completely confirmed the urgent need to equip the divisions with this river-crossing equipment.

It is known that the success of the assault crossing of a water obstacle is determined largely by the rates of crossing of divisions of the first echelon of the army. In the period from 1963 to 1966 in the Baltic Military District persistent research was conducted in this direction, and definite results were obtained. Practice showed that the customary distribution of floating and amphibious river-crossing equipment for reinforcement to the various units and subunits of the division hinders the

effective utilization of this equipment.

In tactical exercises, during the assault crossing of the Neman River, all the amphibious combat vehicles and amphibious crossing equipment were employed centrally. As a result, a river 200 to 250 meters wide was crossed in one hour by a reinforced motorized rifle regiment operating within the forward detachment. The main forces of the division, using routes prepared by engineers, the river-crossing equipment of the forward detachment and the 20-ton floating bridge erected with the one-half of the pontoon bridge park of the attached division, crossed the river in three hours.

The experience of the exercise showed that under favorable conditions for the crossing of tanks under water and centralized utilization of amphibious and river-crossing equipment in cooperation with an airborne landing force dropped on the opposite shore of the first water barrier encountered, it is possible for a motorized rifle division to achieve a high rate in making an assault crossing of a wide water obstacle and to negotiate it in 5.5 hours.

For the purpose of further reducing the time for negotiating a water obstacle from the march, in one of the division exercises in 1965 two 57-mm guns and four 122mm howitzers were towed across a river by tanks moving on the river bottom on routes prepared by engineers. The crews, ammunition, and prime movers for these artillery systems were taken across on amphibious carriers. The feasibility of such crossings was again confirmed in exercises conducted in July 1966. The number of artillery weapons towed across on the river bottom was increased.

It should be mentioned that this method of crossing artillery greatly increases the rate of negotiating water obstacles by the troops and also frees part of the amphibious crossing equipment for maneuvering on the main axis, not just within the army but also within the division.

Combat training practice has shown also that units from the second echelon of the division should be assigned as the forward detachments for the assault crossing of water obstacles. For these units it is necessary in advance to designate the routes, to plan the forward movement of the river-crossing equipment on these routes toward the water obstacle, and to organize cooperation with the airborne landing force. The subunits that are the first to negotiate the water obstacle should, beforehand, be a considerable distance from the river beyond the effective range of enemy tactical nuclear weapons, and deployed in amphibious combat vehicles and

armored personnel carriers, armored reconnaissance vehicles, tracked and amphibious carriers and PTS-type amphibious transporters, so that, when approaching the river, they can make an assault crossing of it from the march.

According to experience gained in exercises, each motorized rifle and tank regiment should have one engineer-reconnaissance group made up of non-T/O reconnaissance divers and one or two groups from the reconnaissance diver platoon of the combat engineer battalion of the division. With this arrangement, a division can reconnoiter and remove obstacles from up to six routes for tanks to cross under water. Well trained personnel of such groups can complete this task in a river up to 300 meters wide within 20 to 30 minutes.

Tanks with the KMT-4 and KMT-5 minesweepers also crossed under water in order to sweep passageways in the antitank minefields on the opposite shore.

As a rule, the rivers along a coastal axis, by branching off in the estuarial area, form a main channel and a great number of branches of different widths and depths. Generally, in the course of an operation on a coastal axis troops will have to make assault crossings of a number of water obstacles one after the other, or even simultaneously. Thus, because of the branching of the rivers in the European Theater of Military Operations, to the depth of a front offensive operation (1,000 kilometers) the advancing troops can encounter 12 to 15 water obstacles 20 to 60 meters wide, six to eight water obstacles 60 to 100 meters wide, up to five rivers 100 to 150 meters wide, and two to three rivers 250 or more meters wide.

The special features of the assault crossing of rivers near their mouths consist in the fact that all of the branches are located at inconsiderable distances from one another. Under these conditions the success of the assault crossing will, to a considerable degree, depend on the well-timed maneuvering of the river-crossing equipment from one water obstacle to the next.

The experience of command-staff and tactical troop exercises shows that all of the amphibious crossing equipment, with none held in reserve, should be used for the rapid crossing of divisions in the first echelon of the armies. The engineer troops of an army have only one amphibious crossing battalion; there may be one or two in a front. This allows each division of the first echelon to be reinforced with one or two tracked self-propelled ferry platoons (three to six ferries), up to a company of

PTS-type amphibians and a platoon of BAV large wheeled amphibians.

Forward detachments can complete an assault crossing of a 100-meter water obstacle in 45 minutes to one hour in organic amphibious crossing vehicles and in those attached to the division, and the main forces of the division -- in three to four hours. During this period the forward units advancing at a rate of seven to eight kilometers per hour, having traveled 25 to 30 kilometers, will be 30 to 40 kilometers from the next river (if the average distance between rivers is 50 to 100 kilometers), and will reach it in four to five hours. The amphibious crossing vehicles, which can travel at 25 kilometers per hour, should be at the second river at the same time as the forward units of the division. In order to carry out the necessary technical servicing and be ready to support the crossing, they should leave the first obstacle immediately after the main forces of the division have crossed, i.e., three to four hours after the initiation of the assault crossing. If the rivers are closer together these vehicles must leave after the forward units of the division have crossed.

The remaining units of the division will be brought across on low-level wooden bridges, on bridges of TPP heavy pontoon parks (TMM heavy mechanized bridges and KMM mechanized treadway bridges). If this equipment can move over dry land at a rate of 35 to 40 kilometers per hour, it can be removed within five to six hours after initiation of the assault crossing and then have time at the next river to support the crossing of the main forces of the division.

If, however, one river has several branches, the division must be reinforced by army and front river-crossing equipment.

Army pontoon parks should be used to reinforce the divisions of the first echelon when making assault crossings of two or three narrow or medium rivers and to erect two army bridges over rivers 150 to 250 meters wide. This is understandable since the bridges can be erected within one-half to one hour and taken down in 1.5 to two hours, while the main forces of the army require about 16 hours to cross.

The pontoon parks of the front (two to four pontoon bridge parks) should be attached to the armies during the assault crossing of rivers up to 250 meters wide and one or two front bridges should be laid over wider rivers. One or two pontoon bridge parks or one-half to one PPS self-propelled ferry park must be in the front reserve. Low-level wooden bridges will be used for supply and evacuation within division areas on army and front routes.

We have come to the conclusion that low-level bridges must be built as quickly as possible at all levels. This will free the organic river-crossing means in good time so that they can be brought to the next water obstacle. On the main river channels, taking into account their great depth, the primary type of bridge should be the composite bridge, made up of wooden trestles and a floating section. When possible, local floating means should be used for the floating section. Rapid rates of advance of the troops, and the extensive employment of airborne landing forces and special detachments for seizing bridges will prevent the destruction of bridges by the enemy. Studies have shown that the enemy will be able to destroy no more than 25 percent of the bridges over narrow rivers, some 50 to 70 percent of the bridges over medium rivers, and all of the bridges over the wide rivers only.

Thus, on one through route to the depth of a front operation, the troops will have to build up to 1,500 linear meters of bridges over rivers having a combined width of 2,500 to 2,800 meters, and up to 20,000 linear meters of bridges throughout the front offensive zone. If we take into account that a part of these bridges will no longer be needed after the divisions of the first echelon have crossed, then the front will require, for continuous use, six to eight through routes (two for each army of the first echelon and two for the front) on which, accordingly, some 9,000 to 12,000 linear meters of bridges will be required.

Just what are the capabilities of the engineer troops of the divisions, armies and front to build wooden low-level bridges?

In each division combat engineer battalion, in an army engineer-combat engineer brigade, and in a pontoon bridge regiment there can be, on the average 70 to 100 linear meters of prefabricated bridge elements at the beginning of war. They will be expended on the first and second water obstacles; reuse of them is practically impossible. Subsequent bridges will have to be built from timber and lumber obtained at the site.

A division engineer-road company can erect a low-level bridge over a river or branch up to 100 meters wide in eight to ten hours. Such rates are not acceptable. In order for the division river-crossing equipment to be freed on time, a low-level bridge must be built within three to four hours after the initiation of the assault crossing. The division must be reinforced with one engineer-road company.

An army is in a position to allocate these companies to reinforce three divisions of the first echelon. In the army there is left one

engineer-road battalion which can erect a bridge over a water obstacle 150 meters wide within four to five hours, or two bridges in eight to ten hours, which allows the pontoon bridge parks from two assault river-crossing sectors to be freed and sent on to the next river. In the area of responsibility of the third division a bridge cannot be built in less than 18 to 20 hours, which does not satisfy present-day requirements. Therefore, each army of the first echelon should be reinforced with one engineer-road battalion from the front engineer-road brigade.

As a result, in the front zone there will be six to nine bridges over rivers 150 to 250 meters wide. Over wider rivers the armies can, with forces of their own and forces of the front engineer-road battalion, erect one bridge in 15 to 20 hours. The two engineer-road battalions and the two engineer-bridge building battalions remaining in the front can build two more bridges in the same period of time. In all, in the front zone there will be a total of six to eight bridges over each water obstacle on six to eight through routes to the entire depth of the operation.

In the Baltic Military District a plan for the assault crossing of rivers and the maneuvering of river-crossing equipment was drawn up in the form of a diagram by the operations and engineer directorates while the operation was being planned. In the diagram, the assault crossing of the first large river was planned in greatest detail and included a calculation of the crossing times for the divisions; the assault crossing of the second river was planned in less detail, and the assault crossing of the third and subsequent water obstacles involved rough planning only. The compilation of such a plan requires great efforts, and thoughtful calculations, but the painstaking labor pays off in every respect. A plan drawn up in this form makes it possible to monitor and control troops during the assault crossing, to deploy the river-crossing, road-building and bridge-building forces and means properly and to maneuver them with dispatch and purpose.

For equipping and maintaining ferry and bridge crossings when supporting the assault crossing of the estuarial branches of rivers, extensive use is made of local river-crossing equipment -- self-propelled and towed barges of the types, "Gustav Koening" and "Johann Welker", which are frequently encountered, for example, on the rivers of a coastal axis in the Western Theater of Military Operations.

These types of self-propelled barges with a cargo capacity of 800 and 1,200 tons can be used singly or in pairs (ferries) for ferrying artillery on prime movers and motor transport. A ferry of two barges replaces approximately one-fourth of a pontoon bridge park in its productivity.

Moreover, one engineer-combat engineer (pontoon bridge) battalion can erect floating bridges for heavy loads out of these barges at an average rate of 10 linear meters per hour. All of this gives the troops the capability to negotiate independently the estuarial branches of rivers without additional reinforcement by pontoon bridge units. In connection with this, even in peacetime the pontoon bridge and engineer-combat enginer units must learn to use the local floating equipment of the probable enemy.

The experience of war games and command-staff exercises shows that for setting up antilanding obstacles, it is necessary to establish, in the front and army, two mobile obstacle detachments made up of two combat engineer companies with minelayers and a platoon of amphibious transporters from the amphibious crossing battalion. In addition, the mobile obstacle detachments must be equipped with other amphibious equipment so that in an hour they can lay up to two kilometers of antitank minefields on the shore and set up 0.7 to 0.8 kilometers of antilanding obstacles in the water. The latter must be coordinated closely with the sea mines layed by the navy.