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SOVIET FUEL SUPPLY CAPABILITIES DURING A SINO-SOVIET WAR. (U)
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SOVIET FUEL SUPPLY CAPABILITIES
DURING A SINO-SOVIET WAR
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SOVIET FUEL SUPPLY CAPABILITIES DURING A SINO-SOVIET WAR.

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FOREWORD

This research project represents fulfillment of a student requirement for successful completion of the overseas phase of training of the Department of the Army's Foreign Area Officer Program (Russian).

Only unclassified sources are used in producing the research paper. The opinions, value judgments and conclusions expressed are those of the author and in no way reflect official policy of the United States Government; Department of Defense; Department of the Army; Office of the Assistant Chief of Staff of Intelligence; or the United states Army Institute for Advanced Russian and East European Studies.

Interested readers are invited to send their comments to the Commander of the Institute.

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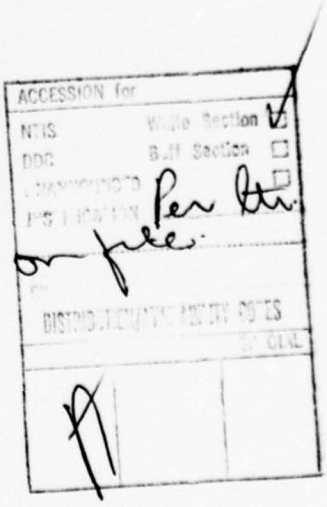

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SOVIET FUEL SUPPLY CAPABILITIES DURING A SINO-SOVIET WAR

I. The Military Setting and the Role of Fuel.

Soviet uncertainties of future conduct of war against China has resulted in the establishment of a logistic system suited to a nuclear war but also possessing the flexibility to supply forces under conventional conditions for relatively short or prolonged periods. Improvements in the Soviet logistics system since 1945, with particular emphasis on fuel, is a reflection of their recognition that inadequate logistics support has been a frequent limiting factor in successful conduct of combat operations in the past and particularly in the Far Eastern theater. The logistic system that has evolved, especially since World War II, is the product of past analysis coupled with an assessment of the peculiarities of a land war on Chinese soil. The Soviet supply effort required to support a war against China will be substantial not only because of the location of the battle area so far removed from the Soviet supply base but also because of the scale of the operation.

The largest military buildup in the history of mankind, without a major cause of war, has taken place along the five thousand kilometer common border between the Soviet Union and the Peoples Republic of China. The Soviet buildup presently exceeds the force opposing NATO and continues to grow in

strength and to improve in sophistication. This has resulted in the Soviets holding a superior military balance in men, equipment and logistics in the Far East.

The present disposition and military strength of the Soviet armed forces along the Chinese border is remarkably similar to that at the outset of war in 1945. By August of that year the Soviets had concentrated a force of approximately 40-45 division which is comparable to the force existing along the border today.

SOVIET STRENGTH IN BORDER AREA (1976)

Regular Forces	Sino-Soviet Border	Mongolia
Divisions (x 9000 men)	43	2
Manpower (establishment)	387, 000	18,000
Border Troops (estimate)	100,000	
Total	505,000	

Source: The Military Balance (1975-76), p. 9 The Institute for Strategic Studies, London.

II. Lessons of the Past.

There are two relatively recent examples of the role of fuel in Soviet military operations which are worthy of analysis - the Czechoslovakian invasion in 1968 and the Russo-Japanese War in 1945.

Czechoslovakian Example. Interestingly, the Soviets experienced fuel-related problems during the Czechoslovakian invasion which were similar to those experienced twenty-three years earlier. For example, the Soviets had planned prior to the invasion to use local fuel stocks. However, neither the political climate nor the populace condoned such a move, thus the local stocks planned for in the operation were not available.[1] In addition there was a general breakdown of transportation and supply services during the first week of operations which was bailed out by an airlift effort later. Furthermore, while the ratio of combat vehicles to soft support and administrative vehicles in most Western European military forces is in the category of 1:4, the Soviets have streamlined their attack echelons to a ratio of 1:2. An obvious advantage is enjoyed in mobility, however the inherent disadvantage accrues to support and in the Czechoslovakian example, to fuel support. The result was that the military formations lacked sufficient organic transport to conduct a smooth operation.[2]

Russo-Japanese Example - 1945. During the Russo-Japanese War the Soviets experienced even more fuel-related problems, including incorrectly estimating consumption rates, being

faced with an unimproved communications network and having a shortage of tankage capacity both mobile and stationary.While the Soviets had previously been involved in military operationsin Manchuria (1939) they failed to properly take into account the Manchurian terrain which included mountains, steppe and deserts. This, together with the absence of an improved road network, resulted in fuel consumption rates far exceeding planned figures. In fact, the Japanese intercepted a message from the Soviet 6th Guards Tank Army urgently requesting fuel on the third day of the operation.[3] The high advance rates, although planned by Soviet tacticians, were also responsible for consumption rates not accounted for which exceeded stockage levels and resupply capabilities. The transportation network available in the Far East proved to be less than adequate to support an operation of this scale. Within the borders of the USSR, the Trans-Siberian Railroad was responsible for the bulk of logistic supply and although efficient in this task, problems surfaced beyond the limits of the railroad. The Soviets were forced to rely on motor transport for fuel supply which proved to be inadequate especially in the Peoples Republic of Mongolia and combat sections of the Trans-Baikal Front.[4] Also, the ratio of combat vehicles to auto transport, as in the Czechoslovakian invasion, was particularly low and thus the rear services were not capable of adequate fuel supply. The geographic location

of the Trans-Siberian posed yet another problem to Soviet logisticians - its close proximity to the Chinese border. The rear support areas of the 1st and 2nd Army Fronts were coincident with the rears of the armies in that area, thus creating a concentration of supplies less than ideal for two army fronts. In addition, the availability and especially the condition of the railroad system inside Manchuria left much to be desired by Soviet logisticians. Aerial photography of the network was not available and the planners had expected a usable rail network. Once again motor transport had to be relied upon which already was over extended. Delay in concentrating railroad troops presented still another problem for fuel resupply missions. During the entire conduct of the war, only a token number of railroad brigades were available to upgrade the transportation network in support of the operation.[5]

III. Fuel in Support of a Sino-Soviet War.

Problems Unique to the Far Eastern Theater. The Soviets realize the fuel supply problems inherent in conducting either a quick or protracted land battle in the Far East. They have analyzed the problems which arose in 1945 and are continuing to address those problems to prevent reoccurrence. However, the Far East by virtue of its location, possesses some inherent peculiarities which are not easily solved. First, sources of fuel are not close at hand. Fuel extraction sited closest to the Manchurian area are in Western Siberia and on Sakhalin Island. Also civilian pipelines in the area of the Chinese border are nonexistent, thus putting an additional

burden on the Trans-Siberian Railroad in the event of war. In order to account for these deficiencies, on-site stockage is required which is expensive and not always practical.

Organization for Combat. The Soviets recognize the importance of fuel in a mobile and mechanized war by ranking the supply of fuel second only to ammunition. Fuel may even have first priority during the pursuit.[6] Given the fact that the Soviets are considerably more mechanized in the Far Eastern Theater than during World War II, fuel consumption will rise accordingly, and when mechanized and armored units are operating in mountainous terrain with an unimproved transportation system, as is the case in Manchuria, a much higher consumption rate can be expected. The Soviets consider that fuel consumption in mountainous terrain may increase by as much as 20-50%,[7] however, that is a conservative estimate by Western standards. A factor of 3 or 4 times is a figure more in line with Western estimates. Adding to the consumption rate problem, the Soviets, after Operation "Dnepr" (1967) increased the operational depth of the first-strike push from 20 to 125 miles.[8] This more than six-fold increase adds to an already strained support line causing the rear services to operate at peak efficiency in order to adequately support the fast-moving advance echelons. Even though much thought has been given to the system of supplying fuel in combat, i.e. the priority of fuel in the logistics system, the mountainous terrain in Manchuria, the unimproved transportation network,

and the increased depth of the first strike push, fuel remains the bottleneck of Soviet logistics.[9]

Strategic

Trans-Siberian Railroad.

In the event of a Sino-Soviet War the Trans-Siberian Railroad will be the backbone of logistics support just as it was during the Russo-Japanese War in 1945. During the summer of 1945, some 22-30 supply trains per day were entering the area of operation in preparation for the war.[10] All told between December 1944 and the summer of 1945, the troop strength practically doubled with the arrival of 500,000 men in addition to 10,000 pieces of artillery and 2000 - 3000 tanks.[11] Virtually all of these reinforcements were transported on the Trans-Siberian Railroad. Since 1945 the carrying capacity of the railroad system has been significantly strengthened with particular emphasis on electrification of western segments and dieselization of the fleet, therefore, providing a more efficient operation.

Baikal-Amur Magistral.

The original idea for the Baikal-Amur Magistral (BAM) surfaced in 1932, however, initial surveys of the terrain were not begun until 1944. Some minor construction of the railroad has been accomplished since then; however, it was not until 1967 that design work was renewed to complete BAM.[12] The growing requirements for the movement of crude oil across Siberia for export plus the prospects of marketing mineral resources along the future BAM evidently made the resumption of the entire BAM project more urgent.[13] At first glance, it

seemed that the most effective way of easing the load on the Trans-Siberian Railroad would be the construction of a large-diameter oil pipeline from the west Siberian fields to the Far Eastern refineries and Pacific ports. However, careful study of the question by an expert commission of Gosplan USSR, together with the Insitute of Complex Transport Problems and with the Oil and Gas Industry departments of Gosplan USSR,led to another conclusion. It turned out to be more economical to build the railroad with special equipment to carry the entire flow of oil.[14]

The Baikal-Amur Railroad complex will provide the Soviets with a more secure transport route north of the Chinese border as well as a transportation system capable of supporting the development of mineral resources in the region. Whereas the Trans-Siberian Railroad parallels the Chinese border within 50 kilometers, BAM, at its closest point is 200 kilometers from China and thus less susceptible to being damaged, cut, or controlled by Chinese forces during a war. Assuming BAM will be completed on schedule in 1983 the Soviets will then possess a highly flexible freight traffic capability not known to them during the war in 1945.

The timing of the renewal of the BAM project is of special interest especially when considering the Sino-Soviet political and military climate at the time. The relations between the two countries worsened in the sixties, but in

particular after 1963, when the first border incident occurred. An increase in Soviet troop strength was also keyed to this year, as troop strength increased from 17 divisions in 1962 to 47 in 1969. The revival of interest in the BAM project in 1967 reportedly was connected with the growth of traffic on the existing Trans-Siberian Railroad [15] and oil movements to Far East refineries and for export.[16] However, the coincidence existing between the renewal of the BAM project and the worsening relationship between the two countries can not be overlooked. Finally, construction on BAM was officially announced in March 1974 by Soviet Party leader Leonid I.Brezhnev as one of two major construction and development programs under the 15-year economic plan (1976-1990).[17 *]

In order to support a Far East war with fuel, the BAM existing plan of combined pipeline-rail-pipeline system for the movement of fuel in peacetime is totally compatible with wartime contingencies. According to existing peacetime plans, crude oil is to be shipped via pipelines from West Siberian fields to Taishet where it will be trans-shipped to tank-car trains taking the oil to Urgal.Here it will be transferred again to pipelines for transmission to refineries (Khabarovsk and Komsomol'sk) and port terminals (Vladivostok, Sovetskaya Gavan')[18] Specially designed tank-car unit trains are planned from Taishet to Urgal which reportedly are more economical than a combination of ordinary railroad and separate pipeline. In a war environment fuel products could be shipped from refineries in western Siberia to Taishet and then east along BAM or the

* NOTE: The other development program is the upgrading of agriculture, mainly animal products, in the non-chernozem central region of north-central European Russia.

Trans-Siberian Railroad. Refined products produced at the Angarsk refinery could also be shipped north to Taishet then east along BAM or placed directly into the Trans-Siberian System. Finally, the refineries at Khabarovsk and Komsomol'sk will have shipping options available to support a Far East war. Furthermore, the Bam-Tynda Spur linking the Trans-Siberian with BAM at midpoint provides the Soviets with movement options not available before.

Obviously BAM will not only provide the impetus and driving force for economic area development but also will impact on the whole transport pattern of the Far East. In time a superimposed local transport system will develop along with many freight stations acting as shipment and transshipment points.Of military significance will be the fact that the harsh winters in the area will no longer restrict the movement of fuel,[19] thus providing the Soviets with attack options the year round.

Peoples Republic of Mongolia Railroad System. The railroad system in Mongolia was primitive in 1945 and remains essentially the same today with the exception of a very important addition. With Soviet assistance a Soviet-gauge line of strategic and tactical significance has been completed between Choibalsan and Tamsag Bulak intersecting the Tamsag salient on the Mongolian Peoples Republic frontier. It was from this salient on August 9, 1945, that the Soviets launched their main attack led by the 6th Guards Tank Army with the

mission of seizing key communications centers and enveloping the Japanese from the West. All railroads within the borders of Mongolia are the broad Soviet gauge which will support all Soviet resupply operations.

Tactical Measures. To supplement the existing and planned railroad network in the Far East the Soviets have developed and refined a variety of tactical measures to insure supply and resupply of fuel during combat. While all these measures have not been created for the sole purpose of support in a Far East war, they are particularly appropriate during a land battle in China because of extended lines of communications. The lines of communications referred to are not only those great distances from sources of fuel products (refineries) but also those envisaged in a short seven-to ten-day war with first - strike drives of mechanized forces and armor up to 125 miles.

In all supply functions and particularly in supply of fuel the Soviets have developed a delivery-forward principle in which the higher headquarters supplies the next two lower headquarters, e.g., a Soviet front would supply the armies and divisions utilizing front transport. Thus the burden of supply to engaged divisions rests with higher headquarters resulting in the bulk of logistical resources located at army and front levels. The obvious advantage to such an organization is owned by armor and mechanized divisions which are not burdened by slow moving supply shuttles using organic vehicles. In effect the armored units take on a highly streamlined character not known to similar units in Western countries.

Pipelines. The Soviets have shown a concern for an overreliance on rail transport and for inadequacy of available wheel transport. Recognizing the Soviet policy of establishing combat troop priority at the expense of the rear services and of their recognized weaknesses, they explored in the late 1950's and early 60's the possibility of using tactical pipelines to move fuel from railheads in the strategic rear to forward depots in the tactical rear.* The tactical pipelines will be of particular value during large scale offensive maneuvers such as those envisaged in the Far East where extended supply lines will be extended even further. In the case of the Far East a classic example of fuel resupply incorporating tactical pipelines would be the movement by rail of refined products from the refinery at Angarsk to a rear supply base at Tamsag Bulak. Tactical pipelines could then be laid from Tamsag Bulak (railhead fuel depot in the strategic rear) to fuel dumps in the rear of tactical formations, i.e. the second echelon of an advance.

Air. Air resupply of fuel could augment the existing systems just as it did during the 1945 war. By the third day of that war, the tank army was out of fuel and delivery by air transport had to be arranged on an emergency basis. [20]

* NOTE: The pipeline laying troops are under the commmand of the director of Rear Services and a pipeline laying regiment consists of 3 or 4 batallions with 350 - 400 men in each. A regiment is responsible for laying 60-80 kilometers of pipe per day moving aviation spirit, petrol, paraffin, diesel oil and even water at a rate of 400 gallons per minute. Pipes can be laid cross country, however, it is more common to lay the pipes along side of roads or railroad tracks.

While this was the first time in Soviet history that air transport was used for fuel resupply it may not be the last since the Soviets have admitted that given poor road conditions, provisions must be made for fuel and lubricant delivery by transport aircraft which most likely will be moved by the AN-12 and An-22 cargo aircraft. Helicopters can also be expected to play a role in the transport of fuel especially at the tactical level.

Stationary and Mobile Tankage. During the 1945 war a serious constraint on accumulating adequate fuel stocks was the general shortage of both stationary and mobile tankage.[22] As in 1945, airlift saved the situation but only because the situation had deteriorated to an emergency condition. Also in Czechoslovakia in 1968 the Soviet tactical formations lacked sufficient mobile tankage to adequately supply the advancing troops, resulting in the breakdown of transportation during the first week of operations. In 1945 the shortage of tankage was compounded by the fact that in Mongolia and in combat sections of the Transbaikal Front, lack of railroads caused the main reliance to be placed on motor transport.[23] In addition, the geographic and climatic conditions of the area had not been taken into account properly, thus the need for motor transport had been assessed too low.

The Soviets recognize the shortcomings of 1945 and 1968 and are attempting to correct them by introducing into their rolling inventory fuel tank vehicles such as the URAL-375 with trailer (9,200 liters) and the ZIL-131 (4,200 liters). They

also possess the capability of simultaneously refueling 24 vehicles, a capability not known in the West. In addition, prefabricated containers are now available and can be used as stationary stock or placed in the rear of a standard cargo vehicle converting the vehicle into a fuel tank-vehicles immediately.

Conclusions.

The Far East is geographically remote to the Soviet power base and as such any war in the area, short or long, would place a burden on the Soviets to support a land war with fuel. Whether the war were to proceed according to a Soviet time schedule based on a high speed mechanized blitz of seven to ten days or according to Chinese plans calling for an initial delaying action followed by a People's war of protracted duration, the drain on the Soviet fuel logistic capability would be similar. The extent of the burden is difficult to assess because of the lack of definite knowledge regarding fuel stocks in position and detailed war plans, however, it is certain that until the 1980's and the completion of BAM the potential fuel supply problems could be the most important limiting factor for the Soviets in a Far East war.

The peculiarities of the Far East theater created problems for Soviet planners during World War II which even though addressed by Soviet analysts, may cause planning difficulties in a future war. The inability of Soviet planners to correctly estimate fuel consumption rates was in part due to inaccurate intelligence assessment of the field of battle, thus the rugged undeveloped terrain with its lack of a

usable road system consumed fuel at rates unknown to the Soviets before. It must be assumed that the art of intelligence gathering has been sophisticated since 1945 and that new fuel rates have been calculated. The scale of any operation in the Far East along with distance involved in a lightning one week war will create a complex and extended logistics tail. Only with the completion of BAM will there be some depth and flexibility to do justice to a war of the magnitude mentioned. The fact that the Chinese are a far more formidable foe than the Japanese of 1945 is even more reason that a substantially secure, reliable supply system be available.

Even though BAM brightens the logistics picture for the Soviets considerably, there are some potential fuel-related problems facing planners. The 1968 invasion of Czechoslovakia reminded the Soviets that the ratio of combat to support vehicles, while creating mobility, creates supply problems - particularly of fuel. Considering the planned Soviet advance rates together with the extended lines of communications, it will be difficult keeping these open recognizing that the Chinese are aware of the key Soviet vulnerabilities. In order to weaken the Soviets significantly, the Chinese would have to cut the Trans-Siberian Railroad, prevent the use of battle railroads, obstruct vehicle transport, and destroy fuel supply dumps. All of these preventive measures are within Chinese capability now.

The transportation system inside China could also create problems for the Soviets. First, the Soviets would like to make use of the Chinese railroad system, however, as noted before, the gauge is smaller than railroads in the Soviet Union and in Mongolia. Also the ground transportation system in China has evolved little in the last thirty years, thus transportation during the warmer five months of the year will create problems similar to those encountered in 1945.

In 1955, as a result of intensive research based on Japanese debriefs, US Army intelligence analysts concluded that the problem of fuel and transportation would continue to be a major constraint in any future Soviet operation in the Far East. This conclusion was based, in part, on the assumption that the economic self-sufficiency in Far Eastern Russia would remain inadequate and the Trans-Siberian Railroad would continue to be the only line connecting Far East Russia with the Urals area. With the start of BAM and its possible completion in the mid-1980's, the problems of fuel and transportation will be modified considerably. The impact of BAM has not been accurately assessed, however its positive relationship to the support of war is obvious.

The completion of BAM is only the beginning. Economic self-sufficiency of the Far East with improved road system, population expansion, airport construction and industrial development will soon appear, all having civilian-economic potentials as well as possessing military capabilities to

either support a war against China or at least to deter one. The emergence of BAM with its associated economic development, together with the special Soviet effort of railroad construction and troop stationing (in the People's Republic of Mongolia) and the innovation of a tactical pipeline capability, comprise an effort designed at strengthening a recognized logistics weakness in the Far East. Only time will tell of the effectiveness of such an effort, but there is no doubt that the Soviet fuel supply system existing in the Far East now is considerably more substantial than in 1945 and the future will result in quantitative and qualitative improvements.

FOOTNOTES

1. Leo Heiman, "Soviet Invasion Weaknesses", Military Review, (August 1969), p. 42.

2. Ibid.

3. Lilita I.Dzirkals, Lightning War in Manchuria: Soviet Military Analysis of the 1945 Far East Campaign, (Rand Corporation, January, 1976), p. 78.

4. Ibid. p. 77.

5. Ibid. p. 79.

6. Graham Turbiville, "Soviet Logistic Support for Ground Operations, RUSI-Journal of the Royal United Services Institute for Defence Studies, September 1975, p. 64.

7. LTC N.Malyugin, "Batallion Rear Elements on the Defensive", Soviet Military Review, July 1973, p. 21.

8. Heiman, p. 39.

9. Ibid, p. 45.

10. Geoffrey H.Kleb, The Trans-Siberian Railroad - Its Strategic Significance in View of the Ongoing Sino-Soviet Conflict and its Proximity to the Sino-Soviet Border (Research Report. USARI, Garmisch, Germany, March 1975) p. 16.

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12. N.P.Belen'kii and V.S. Maslennikov, "The Baikal-Amur Mainline Railroad: Its Area of Influence and its Projected Freight Flow", Zheleznodorozhnyi Transport No.10, 1974, p. 39.

13. Theodore Shabad, "First Segment of BAM Railroad Operational" Soviet Geography: Review and Translation, October 1975, p. 547.

14. V.Biriukov, "The Baikal-Amur Main Line - A Major National Construction Project", Planovoe Khoziaistvo, No. 10, 1974, p. 6.

15. Shabad, p. 547.

16. Biriukov, p. 6.

17. Shabad, (November 1974), p. 587.

18. Biriukov.

19. Belen'kii and Maslennikov.

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21. L.N. Vnutchenko, Victory in the Far East, (Moscow: Military Publishing House, 1966), p. 304.

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