



THE RUSSIAN ARMY'S DEFICIENCIES IN OPERATION "Z"

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Operation "Z" launched by Russia on 24.02.2022 against Ukraine is facing severe logistical problems on the ground. The railway infrastructure they rely on and cannot fully meet their requirements, outdated logistical equipment, difficulties and limitations in securing fuel requirements have been frequently reported problems in the last weeks of the conflict. The logistics support doctrine of the Russian forces contains some organizational and functional inadequacies. From its analysis it appears that a logistic support battalion with its personnel and equipment is not able to fully meet the support requirements of the forces served. Apparently, this deficiency is encountered both at the tactical and the operational and strategic level, as it becomes evident from the analysis of several articles and scholarly works regarding the current Russian-Ukrainian conflict. The present article aims, based on the analysis of information available from open sources (articles, TV reports and social media posts), to identify the source of the logistical problems faced by the Russian armed forces.

Keywords: operation "Z"; military logistics; shortcomings; technique; conventional warfare; doctrine.

On the 24th of February, 2022, the Russian Federation launched a military operation invading Ukraine, which is widely considered an act of aggression. On the 21st of February, 2022, Russia recognized the independence of the Donetsk and Luhansk People's Republics, two regions controlled by pro-Russian separatists, and the Council of the Russian Federation authorized the use of military force on the country of Ukraine. Offensives were launched on several fronts, including Ukraine's borders with Belarus and Russia, and from the occupied territories (Donbas and Crimea). Russian army forces succeeded in besieging or occupying several key cities, such as Kernihiv, Kharkov, Kherson, Kiev, and Mariupol, but the resistance of Ukrainian forces combined with logistical and operational challenges caused the progress of Russian armed forces to slow down (Wikipedia 2022).

The logistical challenges facing the Russian Federation's military may stem from poor planning of logistic support to the fighting force. Based on events in Ukraine in recent weeks, we will analyze this planning, demonstrating the causal link between logistical deficiencies and the lack of success of Russian troops, materialized in their stagnation or withdrawal from several fronts.

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1. Short comings in logistical support

1.1. The Blitzkrieg doctrine implemented in Operation "Z"

The combat strategy "Blitzkrieg" comes from Germany and can be translated as "Lightning War". This strategy involves speed and cooperation among forces, especially tank units, motorized infantry and aviation (Dancu 2010). The doctrine we are talking about was used successfully by Germany in World War II against Poland in September 1939, France in May 1940, Greece in April 1941. The Germans would choose a strategic point favorable for conquest, then mobilize their forces to begin military operations. Once a gap was created on the enemy front, forces were given autonomy to advance rapidly into enemy territory. Forces attacked communication centers to disrupt command and control processes and disrupt the enemy (United States Holocaust Memorial Museum n.d.).

We can observe similar points between the implementation of the Blitzkrieg doctrine and Operation "Z" launched on 24 February 2022. Initially, in the first two days of the aggression, Russian troops managed to advance about 200 kilometers into the Ukrainian territory (Vershinin 2022). However, due to major resistance from the Ukrainian army and citizens, the Russian forces advance subsequently stagnated.

1.2 Role of rail infrastructure in supplying troops

The transport of troops and the supply of forces, both within and outside Russia, is



planned and executed by the Transport Insurance Department, a department serving the military and authorized by the Russian Ministry of Defense. This department is responsible for: developing systems for military deliveries; planning the cost-effective and efficient movement of troops; calculating the potential risks involved in transport missions (Grau and Bartles 2016, 326-328).

Transport missions are carried out by land (mainly using railways) but also by air and sea, both by using the transport equipment available and by contracting transport services from civilian providers. The national railway system is used to design the logistic support of the Russian army and to form solid supply lines. A large part of the army personnel is transported by trains. Logistics support capabilities in most Russian military operations (including Operation 'Z') are also transported by rail. This approach is effective within Russia's own territory, given Russia's territorial expansion. However, logistic support and supply capabilities end at the country's border, from where Russia is forced to use road vehicles. Russia attaches great importance to the use of railways, noting that there are now specialized troops dedicated to their protection, operation and maintenance. These troops total about 10 independent brigades and battalions serving different regions of the country (Grau and Bartles 2016, 326-328).

Russia relies on its railway infrastructure, which is designed to serve direct transport from arms and ammunition factories to the specific depots of large units and establishments. The main reason stems from the vast territory of over 17,100,000 km² that the country needs to control (Ambasada României în Federația Rusă 2021), so efficient and effective military rail transport seems to be the optimal solution (Vershinin 2021).

Russia's railway infrastructure is made up of 1,524 mm gauge tracks, the same gauge being adopted by the other states that were part of the Union of Soviet Socialist Republics, namely Belarus, Estonia, Moldova. (Marian n.d.). We define the railway gauge as the distance between the tracks left on the ground by the wheels of the same axle of a vehicle or the distance between the inner faces of two railway rails, determined horizontally at a 14 mm level below the top of the rail head (Biroul Român de Metrologie Legală – BRML 2005).

A potential attack on Western states would require a logistical effort on Russia's part far beyond its capabilities, given that most Western states use a rail gauge of 1,435 mm, which is the standard for European rail infrastructure. Ukraine, unlike Western Europe, maintains the 1,524mm standard for rail gauge and so does Russia (Marian n.d.). However, the Ukrainian railway infrastructure cannot be used on a large scale, as the main junctions are in big cities, which are not yet controlled by the Russian army. As of 06.04.2022, Russia had large cities such as Kherson, Melitopol, Berdyansk, Donetsk, Luhansk under its occupation and also had access to the related junctions (Champion 2022).



Figure no. 1 Map of Ukraine

An analysis by Gudrun Persson in *Russian Military Capability in a Ten-Year Perspective 2016* provides an overview of MTO forces deployed by districts across Russia. We note that in the western district of the country there are 2 logistics brigades, 2 brigades for equipment storage and 3 brigades dedicated to railway infrastructure, compared to the eastern district of Russia where more forces serving logistics support are concentrated, which creates a possible cause for the deficiency in providing logistics support for Operation "Z" (Persson 2006, 70-71).

To give the reader an idea of what logistic support in the Russian army means, we will define the term logistic support battalion: a Russian MTO logistic support battalion which usually consists of 1,000 troops and 400 vehicles serving the combat forces, with the capacity to transport about 1,800 tons of material for feeding, armament,

TABLE no. 1 Positioning of Russian logistic forces

MILITARY DISTRICT	EST	CENTRAL	SOUTH	WEST
LOGISTICS BRIGADES	4	2	2	2
EQUIPMENT STORAGE BRIGADES	8	3		2
BRIGADES DEDICATED TO RAILWAY INFRASTRUCTURE	2	3	2	3

ammunition, maintenance. The configuration of an MTO battalion comprises a command and an operational part, the operational part being divided into material transport companies, a technical maintenance company and support companies (Grau and Bartles 2016, 332).

2. Poor logistical planning

2.1. Weak supply chain defences

Along a supply chain between the logistics base and the frontline, the structures that provide the necessary supplies to the troops must be protected, especially if the supply chain is formed on a predictable enemy route. Michael Kofman, an analyst at CNA Corporation, stated that Russian troops had poorly planned for the protection of logistical structures, which resulted in massive technical losses (Berkowitz and Galocha 2022). By 10.04.2022, 788 vehicles belonging to MTO logistic forces had been destroyed, 485 damaged and 228 captured by the Ukrainian army (ORYX 2022).

2.2. Outdated logistics technique

Since the supply of fuel, food, arms and ammunition cannot be provided by rail infrastructure alone, these materials must be transported by motor vehicles. These vehicles pose a major problem in advancing troops deep into Ukrainian territory, due to their age, as well as costly and time-consuming maintenance (Vershinin 2021). Russia currently uses 6 different types of trucks to supply troops, of which we list: Kama Automobile Plant (KamAZ), The Urals Automotive Plant (Ural), the Likhacov Plant (Zil), Gorky Automobile Plant (GAZ), Kremenchuk Automobile Plant (KrAZ), and Minsk Automobile

Plant (MAZ) (350). These problems were also noted by the Russian army's technical equipment structures, which led to a halt in the import of two types of military trucks in the mid-1990s (MAZ trucks produced in Belarus and KrAZ trucks produced in Ukraine). However, even today these vehicles are still in the hands of Russian operational units on the territory of Ukraine (ORYX 2022). Even though the import of these trucks was stopped more than 25 years ago, the Russian army still faces problems in providing maintenance for them. Russia bought technology from 4 major manufacturers (KamAZ, Ural, Zil, GAZ), each using specific components and sub-components, so interchangeability between them was almost impossible. This led to a considerable effort to maintain the technique. A concrete example can be given by the Zil-131 truck which uses LPG (Liquefied Petroleum Gas) as a fossil fuel, while most of the transport equipment uses diesel fuel. In 1998, The Urals Automotive Plants signed a contract with the Russian army for the purchase of new, more reliable equipment. This led to the development of "Motovoz", a project involving three new types of trucks (Ural 43206 4x4, Ural 4320-31 6x6 and Ural-5323 8x8). These trucks were designed to be able to split up to 95% of the parts. Due to financial problems, only the Ural 43206 was produced on a large scale and delivered to the army. The decision was made by Anatoliy Serdyukov, Minister of Defence of the Russian Federation from 2007 to 2012.

Today, the standard truck used by the Russian armed forces is the KamAZ-4350, which is found up to the level of a combat battalion's logistic support platoon. Russian logisticians believe that a major difference between the "Motovoz" and KamAZ trucks is the level of complexity for providing maintenance. Motovoz trucks were designed so that additional training of personnel in engine and component knowledge is not required, which is not the case with KamAZ trucks which have a higher level of complexity.

The Zil-131 truck (Figure 2) has a 6x6 drive, a vehicle designed for military missions. It was designed in 1966. Production stopped in 1994, with more than 1,000,000 assembled. The Zil-131 chassis has a carrying capacity of 5,000 kilograms for road travel and 3,500 kilograms on rough terrain.

The GAZ-66 (Figure 3) is a vehicle that is also in the Russian Army's armory. Designed in 1964 and produced in more than 1,000,000 units, the GAZ-66 was for a long time the main material carrier of the infantry structures of the Union of Soviet Socialist Republics.

The Ural-4320 (Figure 4) is a medium-sized truck found on the Ukrainian front. It was designed in 1976 with a 6x6 drive and an engine developing up to 240 horsepower. It has a road carrying capacity of 6 tons, but can also be configured for personnel transport and can hold the equivalent of a platoon (Grau și Bartles 2016, 350-356).

One pattern that can be seen in all these vehicles is the date of manufacture and design, all of which come from the USSR era. More than 40 years on, the demands of the frontline have changed, outdated technology can no longer meet the requirements of a 2022 military operation effectively. Logistic support for the forces must be accelerated and run seamlessly, contrary to what can be seen on the Ukrainian front from the Russian military.

2.3. Lack of fuel

Images showing intact technology abandoned on Ukrainian territory also give us a glimpse of poor planning for Operation "Z" (ORYX 2022). A likely cause of these abandoned trucks and tanks would be fuel shortages. At the organizational level, a Russian Logistic support brigade (MTO) has a battalion under its command with the role of providing fuel and drinking water through pipelines.

Specifically, during the offensive and troop retreat, this battalion creates a pipeline infrastructure, with a lower flow rate than the pipelines supplying fuel to Western Europe, but meeting the needs of the forces on the front (Grau



Figure no. 2 Zil-131 trucks destroyed in Russia's offensive against Ukraine, 2022



Figure No. 3 Gas-66 trucks destroyed in Russia's offensive against Ukraine, 2022



Figure No. 4 Ural-4320 trucks destroyed in Russia's offensive against Ukraine, 2022

și Bartles 2016, 329-332). The strength of this battalion is the time it takes to install the pipelines, up to 3 or 4 days after occupying the territory.

Once the pipeline system is in place, the army connects to the national fuel and drinking water supply infrastructure, pumping these two facilities to logistics bases in the field, from where they are distributed to sub-units via tanker trucks (Vershinin 2021). Official data show that this type of infrastructure has not been widely implemented in Ukraine, with the Russian army still relying on tanker trucks to supply and fuel frontline equipment, which do not fully meet the needs of the frontline, and linking this deficiency to equipment abandoned by the Russian military for lack of fuel (Vershinin 2021).

Conclusions

By concluding the facts presented above, one can see a deficiency in the planning of the attack launched by Russia against Ukraine, at least from a logistical point of view. These shortcomings



Figure no. 5 Russian military servicing a military structure with the role of fuel supply implementing specific infrastructure



Figure no. 6 Russian servicemen serving a military structure with the role of providing fuel by implementing specific infrastructure

were documented long before a conflict began, with Operation 'Z' supporting these assertions with clearly observable facts all along the Ukrainian front. An evocative description of Russia that also

applies to the current context was given by German Chancellor Otto von Bismarck (1815-1898), who said that *Russia is never as strong or as vulnerable as it lets on.*

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