

AMMUNITION CONSUMPTION, DECISIVE FACTOR IN THE WAR IN UKRAINE

Brigadier general (ret.) Professor Viorel BUȚA, Ph.D* (Academy of
Romanian Scientists)
Police sub-inspector Alexandru Florin MELINTE**

Abstract: Starting on February 24, 2022, the Russian-Ukrainian war takes place as a continuation of the one in 2014. The invasion led to Russia's conquest of a fifth of the territory of Ukraine. In the military actions, a special role is played by land artillery, which produced approximately three quarters of the losses on both sides. Artillery consumes a huge amount of ammunition which came to play a decisive role in this war. Without help, at certain heights, with ammunition from the West, Ukraine carries out the counter-offensive with difficulty or may even be compromised. There is currently no end in sight to the war, although some attempts are being made to reach peace.

Keywords: war, Russia, Ukraine, land artillery, ammunition consumption.

I looked with concern and a certain reservation at the statement "I cannot imagine the future world exempt from conflicts, nor the process of reaching it. On the contrary, I believe that we are entering a period of intense social and political conflicts. To understand it – whether on a global scale or within our society – we need a theory of conflicts."¹

How relevant is the statement "The momentum of the troop in battle is directly related to its resilience and moral education, the military training it has received, as well as the number of bullets at their disposal and the good physical condition resulting from proper maintenance. Maintaining this morale means providing fighters not only with the absolutely necessary spiritual tonic but also with ammunition when they run out..."²

No operational plan of an army, from tactical to strategic levels, can succeed without the use of a certain quantity of ammunition. When this condition has not been fulfilled, the outcome has been unfavorable.

* email: vbuta49@yahoo.com.

** Romanian Ministry of Internal Affairs, email: melinte.alexandru@myunap.net

¹ Alvin Toffler, *Previțiuni Premise*, ANTET Publishing House, p. 201.

² Nicolae Velescu, Horia Munteanu, *Tactica serviciilor la micile și marile unități*, Bucharest, 1932, p.2.

Ammunition supply has always been a concern for commanders at all levels. There have been situations where it was necessary to rationalize the consumption of ammunition. An illustrative example is the ammunition status of the Romanian Army during the offensive in the Javorina mountain massif, with 8700 rounds for 75mm field guns, 528 rounds for 105mm long guns, 268 rounds for 150mm heavy howitzers, and 3000 rounds for 120mm mortars. Under these conditions, the Army artillery command had to rationalize the daily consumption of ammunition, reducing it to a few dozen rounds for each gun.³ In the Gulf War, the 40,000 British soldiers estimated that they needed 60,000 tons of ammunition, which means 1.5 tons of ammunition per fighter, enough for thirty days.

But here we are witnessing a war in the post-Cold War era, between two Slavic and Orthodox states, unimaginable decades ago, with immense material and human losses, and unpredictable developments both regionally and possibly globally, with a difficult-to-predict outcome. On February 24, 2022, Russia invaded Ukraine, as a continuation of the Russo-Ukrainian War that began in 2014. This action marked the largest aggression against a European country since World War II. It is estimated that tens of thousands of Ukrainian civilians and hundreds of thousands of military personnel have been affected. By the summer of 2022, Russian forces occupied approximately 20% of Ukraine's territory, without achieving the intended goal of complete occupation within a short period. It is also considered that 8 million Ukrainians migrated internally, and over 8.2 million Ukrainians left the country by April 2023, constituting the largest refugee crisis in Europe since World War II to date. The destructive effects on the environment caused by the war, deemed an ecocide, have contributed to international food crises.

Russian troops, before invading Ukraine, concentrated near its borders, despite Russian officials denying any attack plans. The Russian president, prior to the invasion, announced a "special military operation" to support the separatist republics of Donetsk and Luhansk, whose military forces were engaged in the Donbas conflict against Ukraine. He stated that the objective was the "*demilitarization*" and "*denazification*" of Ukraine.

The invasion was vehemently condemned by NATO, the EU, and numerous states worldwide.

³ Romanian Ministry of National Defense Archives, file 66, f.111 Alocățiile zilnice de muniție.

On February 23, 2023, the United Nations General Assembly adopted a resolution, one year after the Russian invasion of Ukrainian territory, calling for an immediate cessation of the war and urging Russia to withdraw from Ukraine. The resolution was approved by 141 member states, seven states voted against it (Belarus, Democratic People's Republic of Korea, Eritrea, Mali, Nicaragua, Russia, and Syria), and 32 states abstained (including China, an ally). In paragraph eleven of the resolution, the General Assembly demanded that Russia "immediately, completely, and unconditionally withdraw all its military forces from Ukrainian territory, and an end to hostilities is called for."

We will analyze in this article an issue that largely determines the course of the war initiated on February 24, 2022, by Russia against Ukraine. We start with the observation that almost three-quarters of the losses are caused by artillery actions, which have required an immense consumption of ammunition. Once again, it is proven that a soldier, for daily living, needs food, clothing, medicine, equipment, various means of transportation with the corresponding fuel, but for success in battle, they must have high levels of weaponry and ammunition. If the weaponry decreases due to enemy actions or through internal incidents, the ammunition is primarily consumed through its continuous use against the enemy.

The war in Ukraine has become a complex theater of operations, where military resources play a crucial role in determining the outcome of the conflict. An essential element of these resources is ammunition, with a direct impact on the combat capability and effectiveness of the forces involved. This article explores how the consumption of ammunition becomes a decisive factor in the evolution of the Ukrainian conflict. Ammunition is a crucial element in any military conflict, used to support ground, air, and maritime operations.

In the context of the war in Ukraine, the forces involved require constant supply to maintain their operational capabilities and face challenges on the ground. Operations conducted on Ukrainian soil have led to a significant consumption of ammunition. Intense fighting and exchanges of fire have generated constant replenishment needs to meet the requirements of the military forces. Increased ammunition consumption can have a direct impact on military strategies and the ability to maintain control over certain regions. Efficient management of the ammunition supply chain becomes crucial in the context of the Ukrainian conflict. Aspects such as production, transportation, storage, and distribution must be carefully

handled to ensure continuous and rapid supply to units involved in combat. In addition to the increased volume of consumed ammunition, innovations in ammunition technology can significantly influence the evolution of the conflict. Smart artillery systems, as well as other state-of-the-art technologies, can provide tactical advantages and change the dynamics of the battlefield. Besides the direct impact on the front lines, massive ammunition consumption also has significant economic consequences. The expenses involved in the production and supply of ammunition can put pressure on the financial resources of the countries involved in the conflict, influencing their long-term prospects. Ammunition consumption becomes a critical factor in the dynamics of the war in Ukraine, testing both the military and economic resources of the parties involved. How these resources are managed and adapted to the changing requirements of the conflict can play a crucial role in determining the further evolution of the situation.

And in the war in Ukraine, it has been proven that ground artillery constitutes the primary fire support weapon for the actions of ground forces, representing the main means of striking enemy targets in any weather conditions, season, and time of day. Napoleon's statement from two hundred years ago remains eloquent, stating that *"battles are won by artillery"*. During that period, both the French army and the armies of other powers worked to standardize the caliber of artillery pieces to facilitate the supply of ammunition.

Next, we will examine the relationship between the unfolding of the war in Ukraine and the consumption of ammunition, considering that Ukraine's allies estimate that ammunition is running low. Our analysis is based on various sources, as official information is scarce, and the two actors in the conflict present the reality in an exaggerated manner, obviously in their favor.

Western states have increasingly less ammunition to provide to Ukraine for its fight against Russia, warns the United Kingdom in particular, but also NATO in general, according to the BBC.

Admiral Rob Bauer, a senior NATO military official, stated at the Warsaw Security Forum that "the bottom of the sack is visible" and urged states and factories to ramp up their ammunition production. The admiral noted that inadequate investments over the past decades have led NATO member countries to provide weapons to Ukraine, given that ammunition depots are half-empty. The NATO official believes that large volumes and

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substantial ammunition stocks are necessary for NATO to effectively handle a prolonged war if the situation requires it.

James Heapey stated that since the beginning of the invasion in February 2022, the United Kingdom has provided Ukraine with over 300,000 artillery shells and has committed to providing "tens of thousands more" by the end of the year. The State Department announced that during the same period, the United States has provided Ukraine with more than two million artillery shells.

Although the deliveries are very significant, NATO has noted that Ukraine is consuming ammunition faster than it can be replaced by Western powers. Several conclusions can be drawn here: some of the ammunition is destroyed in Russian actions, and cynically speaking, the ammunition is not used efficiently due to the inadequate training of some Ukrainian soldiers. In these conditions, alarming news emerges: Ukraine no longer has ammunition, and NATO countries are increasing their production too slowly. The United States produces 14,000 artillery shells in a month, and the Ukrainians consume 5,000 per day. The ammunition crisis for the 155mm caliber is evident after Ukraine set a record by consuming 100,000 shells per month. The U.S. has signed a \$1.5 billion contract for production both domestically and in Poland.

On the other hand, the Russian army consumes an average of 10,000 to 15,000 tons of ammunition and fuel daily in the war in Ukraine, as stated by the Russian Minister of Defense, Sergey Shoigu, according to digi24.ro.

According to retired Lieutenant Colonel Maciej Korowaj, a Polish military expert specializing in the study and analysis of Russian army actions in Ukraine, ammunition accounts for 70% of the daily supply of 10,000 to 15,000 tons on the front. "*The impressive quantities presented by Shoigu are insufficient, representing only 50% of the daily requirement for the entire army group,*" assessed the military expert.

The Australian officer explains that this year, the Ukrainian army could run out of ammunition before running out of the fight. The current rate of ammunition usage in the war far exceeds ammunition production, without meeting the needs on the battlefield. Also concerning is the observation that the majority of NATO's 155 mm artillery ammunition, consumed by Ukraine, has been taken from war stocks, not production lines, stocks that are evidently limited, leading to a drastic shortage of this vital type of ammunition. Although efforts are being made to accelerate American production, quantities will not increase significantly until 2024.

And, as emphasized by a NATO official quoted by The New York Times, 20 out of the 30 NATO members are "exhausted" regarding the supply of artillery ammunition, and not only that, to Ukraine.

Some analysts have reached the conclusion that there was a misjudgment by decision-makers in NATO member states, who believed that the era of wars with massive ammunition consumption was over. Now, they are surprised to find that the reality is different, facing a militarized state like Russia, which has been preparing for war for a long time, there is not enough ammunition capacity to sustain the conflict in the long term.

It was considered that the massive consumption of ammunition belonged to the past, and therefore, Western governments, since the end of the Cold War, did not envision a major production of weapons and ammunition would be necessary again. Over the last three decades, due to smaller government orders, production batches are becoming more expensive, with longer waiting times. Ammunition is being produced too slowly and in smaller quantities than what is required in this new era of prolonged warfare over several years.

As noted in a recent article by the prestigious Royal United Service Institution in England, "the war in Ukraine demonstrates that war between equal or nearly equal adversaries requires the existence of an industrial-scale, technically advanced mass production capability."

The Ukrainian artillery must compensate through more intense action against enemy positions, partly due to the absence of air strikes to protect the operational deployment of their own troops. This leads to an exceptionally high consumption of ammunition and the depletion of stocks.

It is evident that until the new production capacities create sufficient stocks, the Ukrainian counteroffensive will continue to be challenging due to the inadequacy of artillery ammunition.

It is a fact that the artillery of the Ukrainian army has a diversity of calibers, namely those of the weapons maintained from the Soviet era, but also those characteristic of NATO standards as a result of aid received. Consequently, the ammunition supply flow is more challenging due to the dispersion of artillery units and subunits, taking into account the frontal development of military actions.

The insufficient stocks of artillery ammunition in Ukraine are also due to the fact that supplying countries are not in a state of war and legally cannot compel companies to shift to wartime production. Additionally, the manufacturing companies are unaware of the war's duration, and therefore,

they do not have the certainty that investments in a new and modern production line will be recovered and generate profits.

To address the ammunition shortage issue, it was decided to subsidize private companies, especially those producing 155mm NATO caliber artillery shells.

Certainly, for specialists, a natural question arises: how efficiently is artillery ammunition used by the Ukrainians? Analyzing the statistical ratio between the number of projectiles fired daily and the number of casualties inflicted on the adversary, a cynical conclusion is drawn that, by using ten artillery projectiles, one casualty is produced, although this is not the sole purpose pursued through artillery fire.

The high consumption of ammunition is also determined by the multiple missions assigned to the ground artillery. Without delving too much into technical details, we highlight some missions that the Ukrainian artillery has considered: neutralizing artillery batteries, launchers, artillery, and anti-aircraft missiles; disrupting command and electronic warfare systems; neutralizing personnel and firepower; destroying fortifications; disrupting enemy logistical support activities, and many others. The ammunition consumption is largely determined by the intended impact on the targeted objectives. For example, in the case of firing to destroy exposed personnel and firepower, the projectile consumption increases 2-3 times compared to the scenario where a neutralization effect is desired.

As time passes, the Ukrainian counteroffensive requires an increased quantity of ammunition. Initially, the Russian army's defense was hastily organized, but subsequently, extensive fortification works were carried out on multiple alignments, leading to a higher consumption of ammunition. The principles of fire management, a discipline studied in artillery-focused educational institutions, scientifically illustrate the differences in ammunition consumption for engineering works in various forms and stages of implementation.

On November 13th of this year, the Ukrainian Minister of Foreign Affairs stated that the European Union (EU) is delaying the delivery of one million artillery shells due to the state of the European defense industry and a lack of political will within the EU. This, evidently, diminishes the combat capability of the Ukrainian army in the ongoing counteroffensive. The offer for this quantity of ammunition was made in March, with the stipulation that it should be delivered within a year. In this context, Josep Borrell, the EU's

chief diplomat, emphasized on the same date that the EU has only delivered 300,000 projectiles from the EU arsenal.

The ammunition requirement for Ukraine is determined by at least three factors: a significant increase in Russia's defense budget in 2024 (according to some sources, by 70%, reaching 10% of the gross domestic product), Russia receiving ammunition from abroad (the White House presented satellite images indicating that a shipment from a munitions depot in North Korea was loaded onto a vessel under the Russian flag and transported by rail to a depot near Russia's southwest border. The delivery took place between September 7 and October 1, involving 122mm and 152mm projectiles), and the possibility of reduced military assistance from the United States due to internal political disputes.

It is evident that without ensuring the necessary quantity of artillery ammunition, the Ukrainian counteroffensive, on which Kiev has placed high hopes, partially or even completely fails.

The Ukrainian army is in desperate need of bullets, shells, tanks, and planes. The West is not meeting its requests, writes retired British Colonel Hamish Stephen de Bretton-Gordon, an expert in chemical weapons and former director of SecureBio Limited, in *The Telegraph*.

In this situation, President Zelensky becomes worried and clearly exasperated as the West is distracted by crises in other regions. After 20 months of continuous war with significant material and human losses, the recent dismissals of generals and security officials indicate a particular frustration with the war situation for the leader in Kiev.

The stocks of weapons and ammunition in Western countries are decreasing, partly due to certain quantities being diverted to the eastern Mediterranean. Additionally, the elections in the United States and the United Kingdom next year could prove to be a reducing factor for the ongoing flow of arms and ammunition to Ukraine.

In conclusion, artillery ammunition is crucial for the ongoing war in Ukraine, especially as it approaches two years, with no signs of ending soon. President Vladimir Putin is playing for time, anticipating that Ukrainian forces will diminish in capability, and the Western public's support for Ukrainians will visibly decrease due to the increasing financial sacrifices they have to endure. The war in Ukraine has brought substantial changes to the economies of Western countries. European nations have reduced their dependence on Russia for natural gas supply, but they have

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had to cope with high inflation. Additionally, prices of agricultural products have significantly increased, though they have now returned to pre-conflict levels.

There are many foreign experts who do not foresee a swift resolution to the conflict in Ukraine.

In a commentary, The Telegraph emphasizes that there is a real prospect for Ukraine to lose the war, or worse, a peace deal with Russia could bring a situation to the European continent not seen since 1939.

Interestingly, on November 22, during a virtual G20 summit, the Kremlin leader decided to participate, this time through video conference. "Le Soir" emphasizes that "it was the first time since the beginning of the war in Ukraine that Vladimir Putin addressed the G20 leaders."

His intervention has been carefully analyzed by the entire international press and, of course, it surprised some observers. In this context, "Il Corriere della Sera" reports the excerpt that triggered the most reactions: "*Military action is always a tragedy, [...] and, of course, we must think about how to put an end to this tragedy. Furthermore, Russia has never refused peace talks with Ukraine. It is not Russia, but Ukraine, that publicly announced abandoning the negotiating table, and a presidential decree was signed to prohibit negotiations, especially with Putin, in October 2022.*"

There are actions that indicate there is no consideration of Russia withdrawing from the territories it has occupied from 2014 to the present. According to some reports, Russians and Chinese have secretly discussed the construction of an underwater tunnel to connect the mainland of Russia and the Crimean Peninsula, as per Mediafax.

There is also information suggesting that while publicly expressing full support for Ukraine, behind closed doors, Berlin and Washington are discussing plans to compel Ukraine into talks with Russia to freeze the war along the current front lines, emphasizes the German newspaper BILD.

United States and Germany, as the main suppliers of weapons to Ukraine, want to compel the government in Kiev to engage in talks with the Moscow regime by restricting the quality and quantity of their arms deliveries.

Zelensky should come to the conclusion that the war cannot continue like this and, therefore, he will be compelled to address his nation willingly and explain that it is time for negotiations.

If negotiations cannot take place, the two states are attempting to reach a frozen conflict without the agreement of the conflicting parties. Even if Zelensky and Putin do not want to talk to each other, the contact line would stabilize and become a closed, new frontier between Ukraine and Russia.

Germany is firmly on Ukraine's side, but there is also an opinion that, deliberately, it does not provide what Ukraine needs to liberate the occupied territory, such as Taurus or other Leopard 2 battle tanks. Instead, it limits support to the defense of Ukraine within its current borders.



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