

Kruk attack helicopters: which platform and when?

The Polish Armed Forces currently operate a fleet of attack helicopters, but the available platforms are not capable of performing the tasks assigned for this kind of a weapon system on a modern battlefield. The existing units are equipped with either obsolete and poorly designed aircraft (Mi-24D and W, Mi-2) or with platforms missing the key weapon system – antitank guided missiles (W-3PL Głuszec). The following questions stands: should Poland acquire an off-the-shelf, modern platform offered by one of the leading global manufacturers, or choose an intermediate solution and wait for the future Polish helicopter.

Attack Helicopters

First “attack” helicopters were used on the battlefield during the Korean War, initially in a form of temporarily or experimentally armed transport and multirole helicopters. The French Armed Forces gained extensive experience in using armed helicopters during the war in Algeria. The French were the first to

conduct testing of rotary aircraft dedicated solely to engaging targets with onboard weapon systems. The first specialised, serial attack helicopter – AH-1 Cobra – was employed during the Vietnam War, in the late 1960s. From the very beginning, attack helicopters were tasked with providing fire support to ground units, initially with barrel weapons (machine guns, rotary cannons) and unguided rockets. Attack helicopters quickly proved to be a valuable battlefield asset, able to operate from random landing strips, without the need for expensive and vulnerable infrastructure. They were also fit for multiple types of missions (supporting own forces, attacks on designated targets, patrol operations). The

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inconsistencies apparent in Polish terminology are a proof of their versatility. In Polish adjectives such as *szturmowy* (assault), *bojowy* (attack) or *uderzeniowy* (strike) are used almost interchangeably, while in English these helicopters are described as either “attack” or “gunship”. Since the choppers can be used for so many purposes, “bojowy” (attack) seems to be the best match.

Military planners quickly realised that, aside from support missions, helicopters could be used as “hunter killers” against enemy’s forces. Since 1970s attack helicopters have also been called “tank hunters”, thanks to the development of guided rockets with increased strike accuracy and range (for example, the AGM-114 Hellfire family of missiles, with a 8 km range) as well as the increased payload of choppers (currently 16 missiles is standard for the anti-tank configuration).

Sensors and data exchange systems developed recently (above all, the ability to control UAVs), as well as the ability to convert unguided rockets into guided missiles using a kit and steerable fins, enable attack helicopters to operate freely, and – if used properly – inflict serious damage on the enemy. As Western armed forces shifted towards asymmetrical conflicts, attack helicopters assumed a new role of a convoying platform for patrols and transports. Nowadays, the classic Sikorsky design (a single upper rotor and a tail rotor) is the most advanced available configuration, with an undisputed market position. This fact is proven by the growing number of relatively poor countries, which acquire even the most expensive and advanced platforms. This year, Indonesia accepted a delivery of AH-64E Apache Guardian while India placed a new order for this platform. Pakistan on the other hand chose the AH-1Z Viper. It is uncertain whether a modern attack helicopter would be effective against a technologically advanced, well organised enemy. A capable fleet of fighter aircraft may be able to, at least temporarily, win air superiority and thus limit usefulness of choppers. A war game conducted in September 2017 at the Casimir Pulaski Foundation analysed this question. In the simulation, a fleet of 120 allied AH-64Es destroyed 690 tanks and armoured infantry vehicles of the enemy within the first 2 day of conflict. Guardians effectively supported Territorial Defence battalions and prevented Russian forces from encircling Warsaw. However, the game was based on several optimistic assumptions, such as a large number of Polish AHs, survival of Polish fixed wing aviation and a lack of Russian air superiority.

Attack Helicopters in Polish Armed Forces

The state of Polish attack helicopter fleet is very poor and requires immediate actions. The decision-making paralysis we are currently observing has been tremendously detrimental. Historically, despite having initiated R&D work on new, armed configurations of the Mi-2 light chopper in the 1960s, Poland was forced to acquire the poorly-designed Mi-24D/W from Soviet Union. The main drawback of the latter was its intended dual-use: carrying landing troops and subsequent fire support. Consequently, instead of a highly specialised assault machine, Mi-24s are large and have limited manoeuvrability. Therefore they are an easy target, unable to fire a salvo of rockets and quickly retreat behind a land barrier. Polish military leadership in the 1970s and 1980s was aware of this fact, and despite Soviet pressure, limited the acquisition of Mi-24s. Altogether, the Polish People's Republic purchased only 32 platforms – 16 D-configurations between 1978 and 1985 and 16 W-configurations between 1986 and 1989. After the fall of communism, 16 more Ds, decommissioned from the former German Democratic Republic's army, were transferred to Poland for a nominal sum. In service in Poland, the Mi-24D/Ws were known for high accident rate, which decimated the number of platforms in active service. Today, only 27 units are used, but their service lives are drawing to an end. Since 2012, Mi-24s do not have any anti-tank guided missiles at their disposal. The life service of last ATGMs (9M114 Szturm) expired that year, leaving Mi-24s with 23mm guns, large-caliber 12.7mm machine guns and 57mm unguided rockets for troop fire support. Therefore, in case of a conflict, Mi-24s would need to operate within the range of enemy's MANPADS (currently ~6km) and suffer heavy losses, or remain outside of that range without joining the combat.

This problem was recognised in the 2013-2022 Modernisation Plan, which recommended expediting the Kruk programme. First deliveries were planned as early as 2018, but the deadline, as well as other priorities, have changed several times since. As late as February 2018, the Polish MoD maintained that the platform provider would be chosen by the end of this year, with deliveries commencing in 2019 and concluding in 2022. These assumptions were reviewed in May, and the selection date was moved into undefined time in the future, certainly beyond 2018. Technically, the programme is still in the analysis-concept phase, which started on the 8th of July, 2014. The number of the platforms to be acquired also remains unknown, with experts pointing to 16, 24, 32 or 64 as possible. Purchasing either 24 or 32 is most likely, since this number would allow to fully replace the current 3-

squadron structure of Mi-24s. Buying more would force changes in army's structure as well as affect national defence plans, in order to accommodate a larger number of squadrons and necessary infrastructure. The number of trained pilots and technical staff would need to be increased, generating additional costs. The new manpower and resources would either have to come from other branches of the armed forces (such as armoured or mechanised units) or by raising the overall defence expenditures. Alternatively, the army would need to cut redundant positions in its central institutions and divert funding to operational units. It is important to add that the 2017 Strategic Defence Review recommended raising the number of attack helicopters to 120 platforms.

Despite the official statements, the selection date of the solution provider and the commencement of deliveries is very difficult to estimate, with two possible acquisition paths on the table.

The first one would entail a quick selection of one of the American platforms (Bell's AH-1Z Viper or Boeing's AH-64E Apache Guardian) or the Tiger, manufactured by Airbus. All three are technologically advanced, so the only questions pertain to Poland's financial capabilities and the extended to which the Polish defence industry would be involvement in manufacturing and adaptation.

Boeing AH-64E is a heavy battlefield helicopter, designed for the US Army as a successor of an earlier version introduced in 1984. This helicopter has been chosen by a number of capable armed forces around the world, including the United States, Taiwan, Republic of Korea, Saudi Arabia, Great Britain, Qatar, Indonesia and India. Apache has a large payload, advanced optoelectronic sensors and can be fitted with a Longbow radar. The latter sensor is particularly valuable for destroying enemy's assets – including air defences – from a standoff range. The E-variant brings in capability to cooperate with UAVs and improved connectivity, integrating the platform into the digital battlefield. Currently the UAVs can stream and use data from helicopter's sensors. Eventually, the crew will be able to remotely control an entire swarm of UAVs. The possible downsides include the high price tag for acquisition and operation, as well as the sophisticated ground infrastructure required for the Apaches. Moreover, it is difficult to assess whether this platform is capable of operating in small, dispersed groups, and when faced with enemy's superiority in the air.

The AH-1Z Viper, manufactured by Bell, is the second alternative. The helicopter comes from a long line of AH-1 Cobra choppers, and was designed for the US Marine Corps. This

platform is most likely less expensive than AH-64E in both acquisition and operation. Moreover, due to specific operational conditions of US Marines, it is easy to maintain and is adapted to operate under challenging conditions. Viper was integrated with an on-board radar, but the US Marine Corps has not ordered any for their units. According to the manufacturer, use of passive sensors decreases the chance of discovery by enemy defence systems while retaining radar-range detection capabilities, making it the preferable solution. Viper has an 85% parts commonality with UH-1Y Venom utility helicopter, enabling operational savings when purchased in tandem. For the time being, this option is not considered by Poland, since the acquisition of utility helicopters has been postponed. Nonetheless, Bell is still offering this option to Poland other countries of the region. Viper is also combat-proven, has been purchased by the Marines as well as Pakistan and was down-selected by Bahrain. Disadvantages of AH-1Z are few and far between, since it is the newest of the offered, ready-for-combat, designs. The only uncertainty surrounds the manufacturer's capability to deliver the required number of platforms on time. Currently, nearly all of the available output is needed for the 189-unit Marine Corps order. Only 40-some helicopters have been delivered thus far. However, Bell is nearing completion of Venom deliveries, which will free up manufacturing capacities. It would also be possible to place export production in the Marine Core queue, although the formation's leadership went on record stating that each unit is very valuable and delivery delays could cost lives of Marines. The Polish defence industry possesses extensive experience in manufacturing and maintenance of helicopters and could participate in increasing the output of Venoms.

The Tiger helicopter, designed by a European consortium, is the lightest of the three. It is operational in all three manufacturing countries (Germany, Spain, France) and in one export client – Australia. However, the latter announced plans to decommission the Tiger and replace it with a newer design. Tiger is a very flexible platform, with a large number of available configurations. It has a smaller payload than the American designs (max. 8 ATGMs) and the price tag is likely somewhere between the AH-64E and AH-1Z.

The second path would be to extend the Mi-24 service life and modernise it in WZL 1. The scope would include integration of modern 70mm guided rockets and ATGMs (likely Hellfire or Spike), overhaul of avionics and, eventually, replacement of engines, possibly in cooperation with the Ukrainian industry. It is also feasible to modernise the W-3 Sokół/Głuszec platforms and integrate them with ATGMs and modern unguided rockets. A

W-3 with mock-up Spike missiles was presented by PZL Świdnik during the MSPO trade fair in 2016. The second option would be an intermediate solution, based predominantly on national industry capabilities. Development would be carried out by PZL Świdnik (owned by Italy's Leonardo), PZL Mielec (Lockheed Martin) as well as the Polish WZL-1. The latter entity recently completed an advanced overhaul of Senegalese Mi-24s, complete with new avionics and new Motor-Sicz (Ukraine) engines. On the other hand, PZL Świdnik joined forces with ITWL to modernize W-3 Sokół to the W-3PL Głuszc standard. Świdnik appears to have adequate capabilities, especially since it is a part of an industry leading entity, Leonardo Helicopters. The intermediate solution would delay the selection and acquisition of the replacement helicopter, and enable Polish development investments. For example, Polish companies could participate in Leonardo's AW 249 R&D efforts, which is based on AW149 light transport chopper's drive system and solutions designed for AW129 Mangusta. This helicopter will most likely be a heavy platform (similar take-off weight as AH-1Z) and capable of carrying similar weapon payload as the American designs. It will also be equipped with advanced electronic sensor solutions and be able to cooperate with UAVs. The requirements for this construction are only now being developed. However, if Poland became a project partner, it would be able to influence the development work and design a platform fit for regional needs.

Conclusions and recommendations

1. Poland's defence capabilities would benefit most from a quick acquisition and implementation of one of the proven attack helicopter designs, supplemented by favourable industrial cooperation agreements.
2. Considering current economic situation and multitude of defence needs, it is unlikely that Poland will be able to acquire and implement one of the proven helicopter designs within the next two years. The Kruk programme might not be high enough on the defence modernization priority list.
3. The intermediate solution, which entails overhaul of Mi-24 and/or W-3, cooperation between Polish companies and Leonardo and "polonization" of the AW249, would increase innovativeness and capabilities of the Polish defence and aviation industry. However, it is encumbered with the risk of implementing a temporary solution, which could postpone required replacement indefinitely. The risk is also associated with the AW249 itself. Despite

the fact that it is based on proven solutions, the development programme could encounter unforeseen challenges. The intermediate solution also entails additional expenditures, which could be instead invested in final defence articles and acquire ready defence technologies.

4. The choice between a quick acquisition and the intermediate solution of developing the future helicopter, is a choice between an incremental increase in Poland's defence capabilities and the long-term industrial buildup, which make defence capabilities less important.

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