

## Unmanned Aerial Vehicles in the Polish Armed Forces – current status of the Technical Modernisation Programme

The breakdown in talks between the Polish Ministry of Development and the Airbus Company over a potential offset agreement, as well as the political impact of unsuccessful negotiations, has been widely discussed over recent months. The process of replacing aging fleet of Polish Armed Forces' helicopters (both transport and specialised versions) has been postponed until next year as a consequence of the failed procurement process to purchase utility helicopters that started in 2013. It is worth emphasising that other procurement programmes are also postponed and this one is no exception. A large majority of the military modernisation programmes is significantly delayed in regard to preliminary assumptions of the Technical

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Modernisation Programme of the Polish Armed Forces (2013-2022). This issue also concerns the procurement of the unmanned aerial vehicles within the framework of the 'Imagery Intelligence' Operational Programme. Based on currently available information on the updated version of the Technical Modernisation Plan, it is necessary to underline that the general assumptions of the modernisation plan have not been changed. It seems that a large majority of operational programmes will remain within the previous framework. However, the Ministry of Defence has introduced certain changes in financial assumptions and time frame of the modernisation projects. Therefore, it is worth analysing the modernisation projects based on the first version of the Technical Modernisation Plan and currently available information concerning its updated version (2017-2022).

## Assumptions

Initially, the Modernisation Plan assumed the UAV procurement programmes of 6 different types. These UAVs are expected not only to possess reconnaissance capabilities, but also to carry out strikes against land targets (in the case of the largest types of aircraft). According to the Technical Modernisation Programme 2013-2022, the 'Zefir' procurement programme will perform tasks at the operational level. The programme anticipates purchasing 4 sets of medium-altitude long-endurance unmanned aerial vehicle (MALE UAV) capable of carrying aircraft ordnance. From the very beginning, it was obvious that the 'Zefir' programme would be very expensive, mostly because of the limited number of the producers of these systems. There were similar concerns about the tactical medium-range UAV system for the 'Gryf' procurement programme, which would perform reconnaissance tasks at the tactical level (division). Polish Ministry of Defence planned to purchase 'Gryf' and 'Zefir' UAVs within the framework of an intergovernmental agreement. However, Tomasz Siemoniak, then Minister of Defence, announced on 20 August 2015 that the 'Gryf' system would be acquired from Polish companies in cooperation with a foreign partner on a competitive tender basis. Until very recently, the 'Orlik' procurement programme for the short-range UAV (12 sets providing reconnaissance capabilities at the level of brigade) and the 'Wizjer' programme (15 sets of aircraft, the level of battalion) seemed to be most advanced. According to the previous plans, the contracts should be signed in 2017 and deliveries should take place in 2017-2018 (the 'Wizjer' system) and 2018-2022 ('Orlik'). The reconnaissance tasks on the lowest tiers will be carried out by mini-class VTOL (a vertical take-off and landing) UAVs within the 'Ważka' programme (15 sets) supported by micro-class UAVs (6 sets). It is worth emphasising that all of these programmes are currently delayed by 3 years. According to the latest information from the Ministry of Defence, the government will probably sign contracts for deliveries of the lowest tier UAVs (the 'Ważka' and micro-class procurement programmes) by the end of 2017. The date of signing the contracts for the 'Zefir' and 'Gryf' UAVs is still unknown, however, the advancement of these projects (the MoD has conducted the technical feasibility studies and preliminary technical-and-tactical assumptions for both programmes) can suggest that the contracts should be finalised in 2017. Similar concerns have been raised about the 'Orlik' and 'Wizjer' systems due to further postponement of these procurement programmes. According to the

information disclosed by Col. Krzysztof Zielski from the General Staff of the Polish Armed Forces during the International Defence Industry Exhibition MSPO in Kielce (7 September 2016), it seems that the Ministry of Defence should launch the 'Ważka', micro-class, 'Orlik' and 'Gryf' programmes in the short term.

### Current status

Given the 'Zefir' procurement programme, the Ministry of Defence is only considering an intergovernmental purchase agreement. There are only producers under consideration: Israeli Elbit Systems offering the Hermes 900 UAV and the American company General Atomics with MQ-9 Reaper. It is worth emphasising that the selection of the American company means that the acquisition process will be based on the Foreign Military Sales (FMS) programme. Currently, the Ministry of Defence assumes that deliveries should begin in 2020, however, it also means that the procurement process needs to start within the next few months. Nevertheless, it seems certain that the purchase of any of these two systems will not contribute to development of the Polish military industry's capabilities except basic aircraft maintenance services.

There is no denying that the MQ-9 Reaper UAV is far more advanced aircraft with high-quality reconnaissance and strike capabilities, which is currently used by the Armed Forces of France, Spain, Netherlands, United States, Italy and the United Kingdom. The MQ-9 Reaper is 11 m long and has a wingspan of 20 m. The aircraft can carry a payload of 1,700 kg of the additional equipment including 1,400 kg under wing pylons. The MQ-9 Reaper has an endurance of 27 hours, a maximum speed of 480 km/h and can reach a maximum altitude of 15,240 m. An important advantage of General Atomics' offer is a wide range of weapons (AGM-114 Hellfire missiles, laser-guided GBU-12 Paveway II bombs, GBU-38 and GBU-49 JDAM) and additional equipment such as Lynx multi-mode radar, AN/DAS-1 sensor package and electronic support measures. Undoubtedly, the MQ-9 Reaper provides powerful surveillance equipment combined with strike capabilities, however, the actual price of the aircraft and maintenance costs are very high. It is worth pointing out that Netherlands decided to purchase only 4 MQ-9 UAVs with the associated equipment, parts and logistical support for an estimated cost of USD339 million. The estimated cost of the MQ-9 system shows that the purchase of 4 sets (3 aircraft each) of the MQ-9 system would put a large financial burden on the MoD's budget. On the other hand, General Atomics offers to lease

the MQ-9 aircraft to the Polish Armed Forces which would certainly accelerate the introduction of the aircraft and the training process. The offer of the Israeli company is limited due to the specification of the Hermes 900 UAV. The aircraft has a payload capacity of 350 kg and an endurance of 36 h. However, the aircraft's engine is weaker than in the MQ-9 Reaper. It results in limited performance (maximum speed of 222 km/h and the maximum altitude 9,000 m). The electronic equipment of the aircraft is also produced by Elbit Systems.

The Ministry of Defence has not made a decision to purchase one of these systems so far. According to the currently available information the procurement of the 'Zefir' system will not be launched soon. It seems that the Ministry of Defence will postpone the purchase of MALE UAVs after 2019 due to high cost of this programme.

The procurement programme of the 'Gryf' tactical system seems to be much more complicated. The WK450 Watchkeeper (which is produced by WB Electronics and Thales) and the Hermes 450 (offered by the Polish Armament Group with Elbit Systems) are presently the only offers under consideration in the procurement programme. WB Group is certainly the most experienced Polish UAV manufacturer and it is also an important supplier of communication systems for the Polish Armed Forces. So far the Ministry of Defence has decided to acquire only the FlyEye UAVs from this company. Despite ongoing and planned procurement programmes, WB Electronics is systematically developing its own constructions including more advanced VTOL (vertical take-off and landing) aircraft such as Manta UAV. The success of WB Group and Thales UK means that the crucial parts of the 'Gryf' UAV (particularly those responsible for security and achievement of mission's goals) would be produced by the Polish defence industry. According to the agreement signed in July 2015 between Thales UK and WB Group, the communication and data transmission systems, optoelectronic equipment, cryptographic systems, integration with C4ISR systems, and aircraft flight control systems will be delivered by WB Group. The win in the 'Gryf' procurement programme would be certainly an unquestionable success in the local market giving a chance to develop its manufacturing capabilities. However, it is necessary to underline that the 'Gryf' programme does not assume the production of the aircraft in Poland. According to the MoD's requirements the company is expected to guarantee the final assembly of the aircraft and maintenance services in the territory of Poland. These

requirements can support the Polish Armament Group's offer, even though the company has limited manufacturing capabilities in terms of the UAVs.

The uncertainty over the procurement programme's future has been strengthened when the Ministry of Defence decided to cancel the procurement of the 'Orlik' and 'Wizjer' systems according to the previous requirements (previously the MoD planned to acquire both systems from one company). However, the Head of the Armament Inspectorate Gen. Adam Duda announced on 19 July 2016 that the Ministry cancelled the procurement and decided that both systems can be delivered only by state-owned companies. This decision eliminated the WB Group and the PZL-Okęcie manufacturer (branch of the Airbus Group) from the competition. An approach of the Ministry of Defence can be perceived as an attempt to fight against Polish competitors of the Polish Armament Group. There is no doubt that MoD's move can impact the competitiveness of Polish military companies, monopoly of the Polish armament group and subsequently weaken innovations within the Polish defence industry. The requirement that deliveries of these systems must be done by the state-owned companies means the Ministry of Defence will certainly select the offer of the Polish Armament Group (PGZ). Polish Armament Group's offer is based on the E-310 UAV constructed by PIT-Radwar with Eurotech and Israeli Orbiter 2B UAV manufactured by Aeronautics Defense Systems. The Polish Armament Group assumes that the main facility involved in deliveries will be the Centre for Maintenance Management, Modernisation and UAV Engineering based on WZL nr 2 company in Bydgoszcz. This strategy could certainly the company in Bydgoszcz that has limited capabilities in terms of maintenance services of the western aircraft such as F-16s. The functioning of the company currently depends on providing maintenance services for obsolete aircraft such as Su-22 and MiG-29 aircraft, which are expected to be retired in the 2020s.

The termination of the procurement programmes for the 'Orlik' and 'Wizjer' systems means that deliveries might be delayed by several years. Furthermore, it is worth emphasising that deliveries of the 'Wizjer' systems were planned in 2017-2018; deliveries of the 'Orlik' UAVs were expected in 2018-2022. According to the currently available information the deliveries of the 'Wizjer' systems will begin no earlier than 2020 and consequently the costs will cumulate with spending on other modernisation programmes that have been also delayed. Despite the postponement of the 'Wizjer' procurement programme, the procurement process for the 'Orlik' system should begin in 2017, which was confirmed by Col. Krzysztof

Zielski during the International Defence Industry Exhibition MSPO in Kielce. The information was also confirmed by Katarzyna Jakubowska, a spokesperson for the Ministry of Defence. It seems possible that deliveries of the 'Orlik' system will start in 2018. However, the detailed requirements for this procurement are classified and therefore, it is unclear whether producers must be qualified as state-owned companies. The Ministry of Defence stated that all the companies included in the so-called 'group of companies that are particularly important for industry and defence needs of the country'. It is worth emphasising that the group includes both private and state-owned company. Consequently, it seems that previous requirements (only state-owned companies allowed to participate in a tender) are no longer valid.

Currently, the 'Ważka' and micro-class UAV procurement programmes seem to be most advanced. The contracts for deliveries of these systems will be signed with Polish companies in 2017. The signing of the contract for micro-class UAVs was planned in October 2016, however, the producer has not been selected so far. In recent months, the Ministry of Defence announced an additional procurement programme for tactical short-range 'Albatros' UAV for the Polish Navy. The system is expected to have a VTOL capability. The analytical-conceptual phase for this programme has started in April 2016 and the technical dialogue was announced in July 2016. Deliveries of the 'Albatros' systems are expected in 2019-2020.

## Consequences

The significance of the unmanned aerial vehicles has been marginalised for years; therefore, the procurement of these systems for the Polish Armed Forces was limited. Furthermore, the procurement of UAVs seemed to be of secondary importance due to extremely high costs of the procurement of medium-range and short-range air defence systems. Currently, there are three types of UAVs in service in the Polish Armed Forces: Israeli Aeronautics Orbiter, Polish FlyEye and American ScanEagle. It is worth underlining that the modernisation of the Armed Forces is also related to the imagery intelligence systems, which are supposed to provide crucial information to offensive and defensive systems. Furthermore, it is worth mentioning the Coastal Defence Missile Squadrons equipped with modern NSM (Naval Strike Missile) anti-ship and land-attack missiles that have a range of 200 km. However, these units cannot use the full capabilities to attack targets because of

physical limitations of ground-based radars. The procurement of the third Coastal Defence Missile Squadron will make sense, only if these units have an access to imagery intelligence systems. The UAVs will be also crucial for the 'Homar' procurement programme of long-range rocket artillery, which will have an effective range of approx. 300 km. Consequently, the imagery intelligence systems are crucial for the efficiency of the Polish artillery and missile systems that are currently being developed.

It is also worth considering the procurement of the MALE UAVs that seem to be an unnecessary financial burden for the MoD's budget due to current geopolitical situation in the region (and a decision to move away from the concept of the Polish Armed Forces as expeditionary forces). This programme will be certainly very expensive and it will not improve significantly either operational capabilities of the Polish Armed Forces or competences of the Polish defence industry. The Ministry of Defence should consider these factors in the updated version of the Technical Modernisation Plan due to MoD's limited financial capability and high cost of other crucial procurement programmes. The MoD continues the programme, although there are more important needs that were not included in the modernisation plan. It is worth pointing out that the Ministry of Defence decided to purchase AGM-158A JASSM and AGM-159B JASSM-ER missiles. Currently, the Air Force operates only three squadrons of F-16 multirole fighters, however, a range of tasks is getting wider and wider with further purchases of new types of aircraft ordnance. Therefore, it seems crucial to consider the procurement of additional squadrons before the closure of the F-16 aircraft production lines. It is also worth considering a second-hand purchase and the modernisation of the aircraft by the Polish defence industry in cooperation with the foreign partner. Furthermore, it is also necessary to start the conceptual phase of the procurement programme for the next generation multirole aircraft.

A controversial idea of replacing combat aircraft of the Polish Air Force with UAVs has been forgotten, however, combat capabilities of Polish UAVs might be a useful substitute for the manned aircraft, particularly during expeditionary missions. Moreover, it is worth considering other types of UAVs such as loitering munitions. Currently, there are two systems developed by Polish companies: Warmate (constructed by a private company WB Electronics) and DragonFly (produced by state-owned Wojskowy Instytut Techniczny Uzbrojenia). On the other hand, the Ministry of Defence seems to be interested in purchase of the loitering munitions according to the announcement in November 2016. Media reports



and MoD's announcements still remain unclear. Currently, it is not possible to determine either the procurement process or the number of aircraft and financial conditions (the MoD announced to purchase 'thousands' of aircraft of this type). The loitering munitions is expected to be in service in the regular forces and the Territorial Defence Forces according to MoD's announcements. Given the actual potential of the Polish military companies, the procurement of loitering munitions systems could be an important impulse to develop capabilities of defence industry in Poland. Furthermore, it is also an opportunity for the Armed Forces to operate modern offensive equipment. However, a training process for the future users of these systems seems to be a significant issue, particularly in terms of the Territorial Defence Forces (it should not be considered as a problem for regular military). The main problem is the training program of the Territorial Defence Forces and its limited availability. According to the bill establishing the Territorial Defence Forces, soldiers of this component are supposed to participate in training courses for at least 2 days once a month. This period seems to be not sufficient to conduct an effective training sessions for UAV operators and military training in the same time. It remains unclear how the MoD might solve this problem; therefore, it is necessary to wait for additional information from the Ministry of Defence regarding the purchase of the UAV systems, as well as other types of weapons for the Territorial Defence Forces and regular forces.

## Conclusions

1. The Ministry of Defence should not fight against the local competition in the fields where Polish companies possess crucial capabilities. There is no doubt that MoD's move can impact the competitiveness of Polish military companies, undermine the position of Polish private companies, cause monopoly of the Polish armament group and subsequently weaken innovations within the Polish defence industry.
2. The significance of the unmanned aerial vehicles cannot be marginalised. A lack of imagery intelligence capabilities is the main issue for the Coastal Defence Missile Squadrons. An access to the data related to potential targets will be crucial for the efficiency of modernised equipment of the artillery and rocket forces in the near future.
3. The updated version of the Technical Modernisation Plan should take into consideration current geopolitical conditions and basic needs of the Polish Armed



Forces. The procurement of the MALE UAVs seems to be an unnecessary burden for MoD budget. The programme should be taken under consideration once more due to urgent needs of the Armed Forces in other fields (e.g. the Air Force) that have not been included in the modernisation plan so far.

4. Significant delays in the UAV procurement programmes mean that defence spending on other modernisation programmes will cumulate in the near future. The financial capability of MoD budget calls into question the goals of the Ministry of Defence and the previous modernisation plan.

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