



Remotely Piloted Aircraft Systems (RPAS) in Poland

Report on the current legal status relating to unmanned aerial vehicles

Civil Aviation Authority

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Photo 1: unmanned aircraft FlyEye. Fig. PAP / Andrzej Grygiel 08.03.2012 Source: Service Science in Poland - www.naukawpolsce.pap.pl

UAV in Poland

Unmanned aerial vehicles are usually associated with military applications. However, in Poland they have been used for several years, in typically civil market and in many different areas of the economy. Most common type of service offered by Polish companies using unmanned platforms is photographing or filming from the air. However, thanks to technology of transmitting video in real time drones are also an ideal tool for monitoring mass events, patrolling borders, forests, lakes and territorial waters, roads and highways, coordination and support rescue or documenting losses after natural disasters. UAVs are ideally suited as a photogrammetry platform to study the contamination of the atmosphere, the condition of crops, pipelines or power lines. They are able to perform aerial work operation in areas inaccessible or too dangerous for traditional, manned aircraft. The costs of their purchase and use are often lower, and the operation much easier. The analysis of the information available on the web showed that lack of legal regulations defining the terms of use of UAVs, did not prevent the rapid development of the unmanned aviation in Poland. More than 60 companies are involved in the various branches of unmanned aviation, of which at least 40, are companies providing services. Most often, these are small companies offering services in the form of photographic, film and photogrammetric flights, conducted in sight remote control. In this group there are also companies and research entities involved in the design and production of complete sets of UAVs, their equipment, systems and components.

The range of production and design is very diverse. It includes machines of different types, sizes, equipment and purpose of both military and civilian.



Photo # 2: Helicopter remotely controlled, configured to carry the camera while shooting scenes for advertising. Airport Ułęż. photo by Jacek Drofiak / Arthur Gajdziński

For companies providing services, in most cases, small-size machines are used. Often these are aircraft, which weight is in the range of from about 3 to about 15 kg. Technical particulars in this case depends on the type of tasks and equipment, which must be placed on board. Ofetenlyused UAV category is a multi-rotor and vertical takeoff and landing platform (photo 3 and 4). These devices are characterized by high stability and hovering flight, very precise control capabilities, as well as sufficient lift capacity when needed to carry professional film equipment or measurement. Particularly dynamic development of this type of aircraft in Poland has been observed for4-5 years. This results from greater access to more advanced electronic components used in such structures. Often, UAV sare built entirely by amateurs and still have stability systems, satellite navigation and autopilot programmed how to react in emergency situations.



Photograph # 3: Oktokopter - flying camera. photo by Jacek Drofiak / Arthur Gajdziński



Photo # 4: Oktokopter - flying camera. photo by Jacek Drofiak / Arthur Gajdziński

Unmanned Recreation - drones available in stores

When discussing matter regarding the unmanned aircraft we cannot forget about the increasingly popular hobby, which is known as “**FPV (First Person View) flights**”. This term is usually associated with recreation and model building. However, due to the performance and capabilities of equipment built entirely by amateurs those operations should be recognized in many cases as operations not different from those carried out in a professional unmanned aviation. FPV is a method of equipping flying model with on board camera wireless video transmission system which is visible by operator on the ground

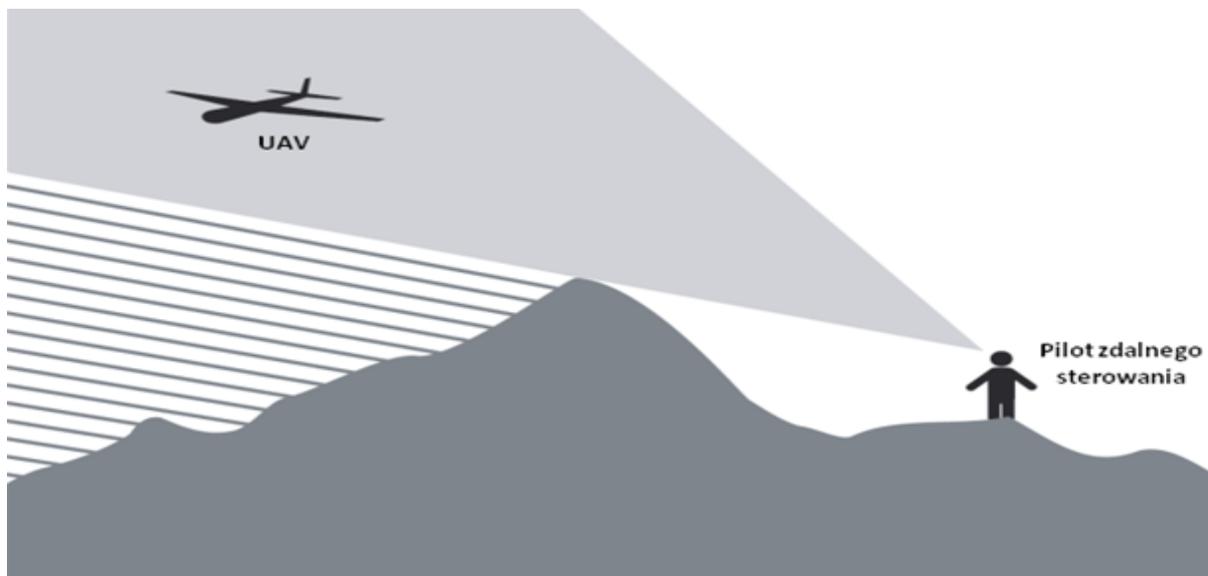


Figure 2: a view from a camera mounted on the RC model

With this equipment the person who flies the model has the same view as the pilot performing flight being onboard an aircraft. It is an attempt to replace the eyes of the pilot in the cockpit which allows execution even VFR flight. The popularity of FPV is caused by its availability and lowering costs of electronic components needed in this type of flying. Currently conducting FPV flight at high altitudes and on distance of several tens of kilometers is not a problem because of that electronics available in stores which allow to use the autopilot or systems that monitors navigation data such as course, speed, altitude and rate of climb of the model. Progress in this field has made a recreational unmanned flights a fact. The equipment is getting easier to use and available to everyone. It is also clear that due to the increasing performance and capabilities the boundary between amateur and professional hardware has blurred and the specific operation being undertaken qualifies it as a typical unmanned flight. Taking into account safety considerations (mainly the lack of ability to provide separation from other aircraft) performing this kind of operation is only possible in isolated areas or airspace in sight of the observer appointed by a remote pilot operating a flight.in accordance with ICAO guidelines

Aviation Law

The first Polish regulations on unmanned aircraft are included in the Act of 3 July 2002 Aviation Law (Journal of Laws of 2012, pos. 933, as amended.)The amendment dated June 30, 2011 (entered into force on 19 September 2011) introduced solution, according to which the performing flights of unmanned aircraft is permitted when certain requirements concerning the aircraft and are met air personnel qualifications. In accordance with the provisions of the Aviation Act detailed requirements and rules for the unmanned aircraft flights are published in the relevant regulations, which are listed below. The rules for operating within line of sight of the remote control operator and of the safety of the UAVs operation which weigh not more than 25 kg as well as the issues related to insurance are set out in the Regulation of the Minister of Transport, Construction and Maritime Economy of 26 March 2013 on the exclusion of the application of certain provisions of the Aviation Law for certain types of aircraft and the conditions and requirements for the use of these aircraft (Journal of Laws of 2013, pos. 440).



Drawing 1: (VLOS) Source: ICAO Circular 328

Flight crew licensing requirements (at the moment only apply to the pilots) specified in the Regulation of the Minister of Transport, Construction and Maritime Economy of 7 June 2013 on certificates of competency (Journal of Laws of 2013, No. 664). The document sets out the terms and conditions for obtaining permission to operate within Visual Line of Sight (VLOS) and out of sight Below Visual Line of Sight (BVLOS).

Admission to fly unmanned aerial vehicles heavier than 25 kg defined in the Regulation of the Minister of Transport, Construction and Maritime Economy of 26 April 2013 on technical provisions and supplies for the special category of aircraft not covered by the supervision of the European Aviation Safety Agency (OJ of 2013, No. 524). The Regulation the requirement to obtain necessary consent to perform flights in a special category for UAVs heavier than 25 kg.

The rules for BVLOS operations (operation, during which the crew performs remote flight using navigation instruments on board or on-board camera) will be set out in the Regulation on detailed method and the conduct of flights by unmanned aircraft in the Polish airspace and procedures for co-operators of these aircraft with air traffic services providers. At the moment the CAA is working on the regulation. The subject is, however, very complicated making it difficult to determine the date of completion of work on the regulation. Therefore, UAV flights below the line of sight, for safety reasons are possible only specially designated airspace in accordance with the provisions of Art. 126 of the Act of 3 July 2002 - Aviation Law (Journal of Laws of 2012, pos. 933, as amended. Amended.).



Photo No. 4.5: Station flight management and aircraft FlyEye (a range of about 30 km, altitude: 3000 m flight time 2 h), Source: www.wb.com.pl

Summing.

In Poland, as of today it is legal to operate flights within sight of the operator. Flights connected to other than recreational and sport purposes require the operator to have a certificate of competence as well as aero-medical certificate of the relevant class and the insurance policy.. UAV heavier than 25 kg shall be permitted to operate in a special category while flights out of sight of the operator are only possible in isolated areas.

What does ICAO say about the UAVs?

Emerging necessity to regulate the use of the unmanned systems in civil airspace, caused an increase in the activity of organizations such as ICAO in the area of unmanned aviation. The organization set up under their auspices a special working group to work on the integration of unmanned systems in international civil airspace. In 2011, ICAO issued Circular 328 Unmanned Aircraft Systems which extensively discusses the issues and challenges of unmanned aviation. In recent times, the first changes in the Annexes to the Chicago Convention have also been introduced. The changes mainly relate to definitions and general rules for the operation of flights, aircraft registration and accident investigation. However, they are one of the first attempts to regulate this complicated issue in the field of international aviation regulations.



EU / EASA.

Regulation of the European Parliament no 216/2008/WE of 20 February 2008 authorized the European Aviation Safety Agency (EASA) to settle legal issues related to the operation of civil unmanned aircraft which takeoff weight exceeds 150 kg. UAVs used by the military, government, or built for experimental or amateur purposes, as well as all civil UAV which weight does not exceed 150 kg are exempt from the supervision of the Agency. Determination of rules for the use of these aircraft has been entrusted to the national aviation authorities. This situation, however, may soon change. In early July 2013, the European Commission published on its website, announced a long time, "RPAS Roadmap". It is a document developed by the **European RPAS Steering Group (ERSG)**. Appointed by the European Commission team to help the process of integration of unmanned systems of European airspace. The document sets out an action plan for the period 2016 - 2028, and one of its first objectives is the **need to abolish the limit of 150 kg** and acquire the supervision of EASA also smaller UAVs. This is due to the fear of too much variation in the provisions in force in the various countries of Europe. The reason for the planned changes is the fact of very dynamic development of the possibilities of using mainly small unmanned platforms, which often does not exceed the weight of several kilograms.

National Authorities

Below a few examples of the regulations created and used in various European countries and the USA are presented..

United Kingdom

The provisions in force in the UK are a very good base to follow, which is reflected in the laws of certain European countries. United Kingdom has been working on its regulations for several years. Those regulations are transparent and based on analysis of what is actually happening in the field of UAVs. In the UK the flights must operated within sight of the operator with use of UAVs weighing not more than 20 kg. The following restrictions are applied: ban of flights at a distance of less than 150 m from the cities, population centers and residential areas ban of flights at less than 30 m from people and the obligation to have liability insurance. In addition, each type of commercial activities requires registration and approval of aviation authority, as well as the respective licenses held by the UAV pilot. Flights out of sight require obtaining the approval of aviation authorities and can be conducted in a dedicated airspace specifically for this purpose. Various types of derogation may be used for from the above principles, after meeting the relevant requirements. . However, the derogation must be accepted by the aviation authority. Those issues are described in the document CAP 722 Unmanned Aircraft System Operations In UK Airspace - Guidance. At the moment in England operate more than 140 UAV companies conducting services.

Germany

In Germany perform of commercial / operational flights within line of sight of the operator



conducted by the unmanned aircraft with a weight not exceeding 25 kg after is allowed after obtaining permission for operation. Flights out of sight and UAVs heavier than 25 kg are not allowed.

France.

France participates actively in the work of JARUS. Regardless of the result of the work of the group, France for several years now has been conducting the process of having to define the rules of use of UAVs in the territory of that State. As a result, the system has been developed that specifies the following classification of the UAVs:

- flying models weighing less than 25 kg;
- UAV Class C (aerostats);
- Class D UAVs weighing less than 2 kg;
- Class E UAV weighing from 2 to 25 kg;
- Class F UAV weighing from 25 to 150 kg;

Each class also includes the categorization on the type and power of the engine, limitations of the use of the airspace, requirements for the qualifications of the personnel and technical issues. In France there have been also introduced the rules for the authorization of an UAV by its manufacturer, terms of use of the prototypes and performing flight tests and experiments, as well as the rules for transport and utilization of the UAVs.

Sweden

Provisions concerning UAVs were defined by the Swedish Transport Agency in 2009 in "The Swedish Transport Agency's regulations on unmanned aircraft systems (UAS). An important element of the Swedish legal system is to use the kinetic energy of the aircraft (triggered during the impact of an obstacle) as one of the criteria for the classification of UAVs, which was determined as follows:

Category 1A: UAV with a maximum take-off mass of less than or equal to 1.5 kg and the maximum kinetic energy of not more than 150 J designed to operate in sight.

Category 1B: UAV with a maximum take-off weight more than 1.5 kg but less than or equal to 7 kg and a maximum kinetic energy of 1000 J designed to operate in sight.

Category 2: UAV with a maximum take-off weight more than or equal to 7 kg designed to operate in sight.

Category 3: UAV certified for flight and designed to operate out of sight.

For each category are also defined the detailed requirements for the construction, certification, obtaining a certificate of airworthiness, pilots and technical staff training, markings, registration, planning and execution of air operations, environmental impact and insurance. The whole requirements are coherent and transparent documents that uniquely identifies the full range of topics UAVs.



Denmark

In Denmark it is allowed to operate flights within sight of the operator unmanned aircraft with a weight not exceeding 25 kg and at height of not more than 150 m. Flights shall not be performed in the controlled airspace and near airports. Especially for UAVs there has been established separate radio frequency.

Netherlands

In the Netherlands flights must be operated within sight of the operator of the unmanned aircraft with a mass not exceeding 25 kg and at height of not more than 300 m, outside the controlled zones. However noteworthy is another aspect of the activities of Netherlands Authority - the establishment of an international group called JARUS in 2007 in cooperation with EUROCONTROL. The JARUS task was initially to develop international regulations concerning UAVs weighing less than 100 kg – and only rotorcraft. In the work of this group are involved Australia, Austria, Belgium, Canada, Czech Republic, France, Germany, Switzerland, the United Kingdom and the United States as well as organizations such as EUROCONTROL, EASA. Currently, the JARUS group is not only focused on rotorcraft, but expanded into all types of UAVs weighing less than 150 kg. As an example of the consistent conduct of that State there should also be mentioned another event - the establishment of the civil-military study group, which task is to solve a number of problems arising from the use of the UAVs in the airspace of the Netherlands. As a result of this action there has been established the National Research Laboratory UAS.

USA

In the United States the right to perform unmanned aircraft is reserved only for unmanned aerial vehicles with appropriate permission of the local aviation authority. Special certificates are issued for the state-owned aircraft used for example by the fire brigade, police or border guards and for aircraft used as an experimental platform (manufacturers, research bodies, universities). As of today there is no possibility of performing commercial activities with use of the UAVs (photos, filming from the air). The FAA is currently leading work on regulations to enable the integration of UAVs (also the smallest) with manned air traffic. Completion of the work was planned for 2015 but is already known that due to the complexity of the topic FAA fails to meet that projected deadline.

Summary

Further development and functioning of the unmanned aviation in Poland, will largely depend on properly constructed regulations covering this area of aviation. Legislative work must adequately cover both large and small platforms which have begun to dominate in the civilian market. Its scope must embrace the principles of performance, flight crew licensing, technical issues, and must importantly operational procedures. It shall take also into account the future operations outside the designated areas and fully integrated flights with other airspace users and the requirements which apply in the airspace. Please note that this type of flying requires



a well developed regulations, because not all of the operating principles of the traditional aviation can be applied directly to unmanned aviation. Existing regulations also requires updates. Analysis and possible amendment of art. 126 of the Aviation Law is required, which is the basis for the conducting flights of unmanned aircraft in the Polish airspace. It requires to provide UAVs in equipment allowing the same g flight, navigation and communication as manned aircraft but does not consist the specification of devices and systems responsible for the separation of UAVs from other airspace users. Only providing the specification and the requirements for the use of such systems will be a base to ensuring an adequate level of safety for use of UAVs and their integration with manned air traffic. The problem may also arise from the lack of proper classification of unmanned aerial vehicles, lack or ambiguity of some definitions or referring to of terms which are not used in international documents. The issues related to the protection of citizens' privacy and the use of UAVs for state services such as the fire brigade, police or border guards also require deep analysis. However, taking into account the fact that those rules are the first attempt in Poland to formalize the civilian use of UAVs, it can be assumed that those rules area good basis for further legislative work. This work however, requires proper preparation and a thorough knowledge of unmanned aviation. Taking that into account the President of the Civil Aviation Authority appointed in March 2013, the Team on Unmanned Aerial Vehicles. The team performs its tasks by organizing meetings and consultations with the representatives and experts from the industry, participation in training sessions and thematic conferences as well as the collection and analysis of information regarding use of UAVs in Poland. The results of those activities will determine the specific characteristics and needs of different market sectors. They will also help to determine the UAV types used in Poland, the scope of ongoing flights and many other relevant information. Team also focus on educational activities and providing information to the public. This is particularly important due to the fact that a large part of the people associated with the performance of unmanned aircraft have not had earlier contact with the provisions and aviation law. The above described activities will allow the team to develop useful regulations which shall provide the proper level of safety.