

Remotely Piloted Aircraft Systems (RPAS)



a New Area of Aviation Activity in Ireland

The first question to be answered is 'What is a Remotely Piloted Aircraft System' (RPAS)?

The staff answer is: 'Any aircraft and its associated elements, other than a balloon, kite or small aircraft which is intended to be operated with no pilot on board'.

Put into lay man's language it basically means an aircraft which is flown without a pilot being on board and this includes any ancillary equipment, such as a remote pilot station or command and control link used to control the aircraft.

The key word in all of the above is 'piloted' which means that the system is being controlled or flown by a pilot/systems operator on the ground. This is totally different to the concept of 'autonomously' operated systems

where the flight mission profile is uploaded into the system and it then gets airborne and carries out its mission without any input from persons on the ground. Currently, the IAA is only interested in RPAS which are to be used in the civilian market. Military operations, which may include autonomous operations, are deemed to be a State activity and are beyond the remit of the IAA.

The use of RPAS as a means of carrying out tasks such as aerial photography, aerial survey, etc. has seen a massive increase worldwide over the past five years or so as technological advances have made such systems cheaper to purchase, more reliable and mission capable.

As part of the process of creating Standards and Recommended Practices (SARPs) applicable to the operation of such systems in the civil

aviation environment, the International Civil Aviation Organisation (ICAO) issued a publication (ICAO Cir 328 *Unmanned Aircraft Systems (UAS)* in March 2011. It is important to note that within this publication ICAO makes the following statements:

"Civil aviation has to this point been based on the notion of a pilot operating the aircraft from within the aircraft itself and more often than not with passengers on board. Removing the pilot from the aircraft raises important technical and operational issues, the extent of which is being actively studied by the aviation community."

Unmanned aircraft systems (UAS) are a new component of the aviation system, one which ICAO, States and the aerospace industry are working to understand, define and ultimately



integrate. These systems are based on cutting-edge developments in aerospace technologies, offering advancements which may open new and improved civil/commercial applications as well as improvements to the safety and efficiency of all civil aviation. The safe integration of UAS into non-segregated airspace will be a long-term activity with many stakeholders adding their expertise on such diverse topics as licensing and medical qualification of UAS crew, technologies for detect and avoid systems, frequency spectrum (including its protection from unintentional or unlawful interference), separation standards from other aircraft, and development of a robust regulatory framework.

The goal of ICAO in addressing unmanned aviation is to provide the fundamental international regulatory framework through Standards and Recommended Practices (SARPs), with supporting Procedures for Air Navigation Services (PANS) and guidance material, to underpin routine operation of UAS throughout the world in a safe, harmonized and seamless manner comparable to that of manned operations. This circular is the first step in reaching that goal.

ICAO anticipates that information and data pertaining to UAS will evolve rapidly as States and the aerospace industry advance their

work. This circular therefore serves as a first snapshot of the subject."

Additionally, within the Convention on International Civil Aviation of 1944, ICAO makes the following stipulation:

"No aircraft capable of being flown without a pilot shall be flown without a pilot over the territory of a contracting State without special authorization by that State and in accordance with the terms of such authorization...."

It further goes on to make the following statement with regard to Model Aircraft:

Model Aircraft

"In the broadest sense, the introduction of UAS does not change any existing distinctions between model aircraft and aircraft. Model aircraft, generally recognized as intended for recreational purposes only, fall outside the provisions of the Chicago Convention, being exclusively the subject of relevant national regulations, if any."

The importance of this distinction and its effect on the current legislative situation in Ireland will become apparent later. Another key area of concern regarding RPAS is the current requirement, as set out by ICAO, for such systems to be operated in "Segregated Airspace" as follows:

Segregated Airspace. Airspace of specified dimensions allocated for exclusive use to a specific user(s).

"To date, most flights conducted by UAS have taken place in segregated airspace to obviate danger to other aircraft. Current UA are unable to integrate safely and seamlessly with other airspace users, the reasons for which are twofold — the inability to comply with critical rules of the air, and the lack of SARPs specific to UA and their supporting systems."

Additionally, the ability of such systems to be able to comply fully with the provisions of the Rules of the Air, particularly in respect of the basic principle of collision avoidance such as "See and Avoid", must also be taken into account when considering their operation as follows:

"The lack of an on-board pilot introduces new considerations with regard to fulfilling safety-related responsibilities such as incorporation of technologies for detect and avoid, command and control, communications with ATC, and prevention of unintended or unlawful interference."

"Aircraft operating without a pilot on board present a wide array of hazards to the civil aviation system. These hazards must be identified and the safety risks mitigated, just as with introduction of an airspace redesign, new equipment or procedures."

Current Regulatory Situation in Ireland

Ireland currently is one of only six EU Member States who have legislation governing the use of RPAS within the State (Aeronautical Notice O.63). Where a system is to be used for "commercial" purposes such as aerial photography or surveying, the IAA have applied the criteria that the Operator will have to be the holder of an Aerial Work Permission issued by the Authority and the operating conditions, and any restrictions imposed on the operation of the system, will be set out in that Permission.



With regard to the requirement for RPAS to be operated in "Segregated Airspace", currently there is no provision under the Air Navigation Services Providers legislation for such areas of airspace to be defined and promulgated to other airspace users. As far back as August 2010 the Aeronautical Services Department, Flight Operations Department and Air Traffic Operations Department embarked on a joint project to address the issues regarding the operation of RPAS in Irish airspace and as a result some appropriate guidance material (Operations Advisory Memorandum O2/2012) and a Safety Leaflet (IGA 5) have been produced.

Additionally, there have been initiatives launched in the wider European scene by both EASA and Eurocontrol (INOUI - Roadmap for UAS Integration in the Single European Sky) as well as in other jurisdictions such as the United States and Australia. It is worthy of note that initially the scope of any EASA sponsored legislation was to be restricted to RPAS with a maximum mass of 150 kilograms or greater, however, following pressure from the EU Commission this has been extended to include all RPAS.

To date, few National Aviation Authorities have come out with definitive policies, although some, such as the IAA, UK CAA and the FAA, have issued guidance material covering the operation of these systems. The FAA is shortly to publish a policy and supporting material on the operation of RPAS in the United States.

Scope of RPAS Operations in Ireland

To date, 24 Aerial Work Permissions have been issued by the IAA covering a mix of fixed wing and rotorcraft systems and all of these are classified as Micro/Light systems with an operating weight of 25kg or less. Two of these operators have also been issued with an approval to operate as a Registered Training Facility (RTF) to provide training in how to operate the systems.

Several potential operators of these "micro" RPAS have contended that their equipment and systems are exempted from the provisions of current legislation as they are below the weight criteria of 7 kilograms as set out in Article 5(3) of the Irish Aviation Authority (Rockets and Small Aircraft) Order, 2000 and are therefore by definition deemed to be

"Model Aircraft". However, it is the position of the Irish Aviation Authority that as these systems are to be operated for commercial hire and reward then, based on the ICAO statement that Model Aircraft are generally recognised as intended for recreational purposes, they are not entitled to be operated under the provisions of the Order and must therefore be operated in accordance with the provisions of an Aerial Work Permission and any other pertinent sections of legislation currently in force such as Rule 3 - Low Flying of the Rules of the Air Order.

Based on current predictions from within the RPAS community in Ireland, the number of approved operators could increase to over 100 by 2015. On the wider European scale, a recent study carried out by Eurocontrol and EuroCAE on behalf of the Director General for Enterprise within the EU Commission, has predicted that by 2017 some 70,000 jobs will be sustained by the RPAS industry with an annual turnover of some €14 Billion.

