Revista Europea de Derecho de la Navegación Marítima y Aeronáutica

ISSN versión electrónica: 2386-8902

Trends in legislation develepment concerning unmanned aerial vehicles in the EU and Poland

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Summary: The article analyses the EASA foundation of the legislative proposal from December 2015 on unmanned aerial vehicles and the regulatory activity of the Polish Civil Aviation Authority in the context of international law. Remarks are posed on the existence of space for a Polish national regulation after the EASA proposals will be passed.

Keywords: Unmanned aerial vehicles, Unmanned aircraft, Legislation, EASA, Polish Civil Aviation Authority; Technical standards.

1. Introduction: definitions and an outline of problems

Drones have the potential to deeply influence aviation and economy. A proper regulatory framework should help unleash this potential. Unmanned aerial vehicles (UAV), also called 'unmanned aircraft' (UA), or just 'drones' caught the attention of policymakers in the EU.

The Aviation Strategy for Europe unveiled in its recent version in December 2015, highlights the opportunity given by UAVs to enter into aviation industry for more Small and Medium Enterprises (SMEs) and to develop new services that will influence even non-aviation businesses. However, the Strategy concludes that Today's aviation safety rules are not adapted to drones [1].

A simple 'catch-all' definition of unmanned aircraft is provided by the US Federal Aviation Authority (FAA), reading that it is an aircraft operated without the possibility of direct human intervention from within or on the aircraft [2].

Worth noticing is the term unmanned aircraft systems (UAS), defined in another document as airframe, ground control station, command and control links, and crewmembers [3]. The category of UAS can be divided into remotely piloted aircraft systems (RPAS) that need an on ground operator and unmanned autonomous systems.

The EASA Technical Opinion – Operation of unmanned aircraft defines an unmanned aircraft as any aircraft operated or designed to be operated without a pilot on board [4].

The fact that today's UAVs do not carry people on board, determines the safety risks that need to be addressed by the regulations.

These risks encompass the safety of the humans on the ground (i) and in manned aircraft that are endangered by a mid-air collision with a drone (ii) as well as damage to critical and sensitive infrastructure (iii) which may be caused by UA. Finally, the safety of the UA is also an issue (iv) but it is driven by commercial aspects [4].

In order to determine the safe conditions of operations, three factors need to be taken into account, i.e. the mass of the aircraft (i), density of the population above which the operation

takes place (ii) and density of air traffic together with the types of airspace (iii) [4]. For more dangerous drones and types of operations ensuring the proper remote communication or functioning of the autonomous steering systems is a crucial issue.

2. International context

The legislative framework for UAVs includes i. a. the Chicago Convention. Its art. 8 provides for a possibility of using such aircraft, if special authorisation is given, and in such a manner as to obviate danger for civil aircraft. The rules on airspace (c.f. Art. 1, 3 (c), 12 Chicago Convention) apply also to drones. The ICAO has been active in regulating UA, i.a. by introducing Remotely Piloted Aircraft Systems (RPAS) into Chicago Convention's Annex 2 by means of Amendment 43 to the said Annex. This document now provides for basic rules on submitting flight plans for RPA (1.6.) and RPA certificates of airworthiness (2.1(a)). [5].

In the Circular ICAO Cir 328 /AN/ 190 the broader term UAS is used, embracing also autonomous aircraft. This Circular is relatively demanding for UA, stating e.g. in 1.7 that Unmanned aircraft (UA) are, indeed, aircraft; therefore, existing SARPs (i.e. Standards and Recommended Practices) apply to a very great extent. This circular has more a consultative character, as emerges from 1.6 [6], but may act as a guidance for ICAO member states in their international harmonisation's efforts.

The ICAO Circular recognises some specific problems regarding UA, and is trying to set guidance for integrating the use of them into the airspace regulations, like in 5.10, where it reads: Whether the aircraft is piloted from on board or remotely, the provision of ATS should, to the greatest practicable extent, be one and the same. The introduction of RPA must not increase the risk to other aircraft or third parties and should not prevent or restrict access to airspace. ATM procedures for handling RPA should mirror those for manned aircraft whenever possible. There will be some instances where the remote pilot cannot respond in the same manner as could an on-board pilot (e.g. to follow the blue C172, report flight conditions, meteorological reports). ATM procedures will need to take account of these differences [6].

As will be seen the ICAO member states as well as EASA often take a more liberal approach towards UA that might be drawn from the ICAO framework.

3. Legislation of selected states

3.1 USA

In the USA the most important regulations regarding UA were introduced in year 2012. The relevant pieces of legislation are relatively liberal towards hobby or recreational use, and more demanding as to business uses. The latter requires an approval from the FAA which can be obtained in three ways, i.e. by obtaining: Special Airworthiness Certificates – Experimental Category (SAC-EC) for civil aircraft to perform research and development, crew training, and market surveys but carrying persons or property for compensation or hire is prohibited (i); obtaining a UAS type and airworthiness certificate in the Restricted Category for a special purpose or a type certificate for production of the UAS (ii), or Exemption with a civil Certificate of Waiver or Authorization (COA) for civil aircraft to perform

commercial operations in low-risk, controlled environments (iii) – the so called 'Section 333 Exemption'. The UA in the USA need to be registered [7].

Currently the FAA is working on a regulation for small UAS (no heavier than ca. 25 kg) conducting non-recreational operations, trying to further simplify the today's regulation [8].

3.2 France

France introduced the UA regulations already in 2012, by two decrees (French 'Arrêtés'). They were superseded by new decrees published on December 17th 2015, taking effect from the beginning of 2016. The first decree regards design conditions, conditions of use and the pilot competence (the 'Design Decree') [9] and the second regards integration of UAS with other airspace users (the 'Airspace Decree') [10].

The French regulation are operation-centric (based on the use of the aircraft, rather than the vehicles specifications) and distinguishes between private and business use (the latter is referred to as 'specific mirroring the terminology of the European legislative works). UA under 150 kg do not need to be registered [9,10].

The UA used for leisure activities are divided into two categories: A and B. In the new regulations, as opposed to the former one, unless a specific authorisation is given, cities constitute no fly zones for leisure UA [9,10].

For the specific activities, the conditions for authorisation are assessed according to four scenarios (S1-S4) defined in Annex 3 to the Design Decree. The reform simplified some administrative procedures, e.g. with respect to the so called manual, documenting the activities of the UA-operator. For most operations it suffices when the pilot as a certificate of competence, yet for more complicated operations, the pilots need to be licensed and have an experience as pilots of manned aircraft [9].

The French regulations have been chosen as an example of the influence of legislation on the industry – Since France adopted civil UAS regulation in 2012, the sector has developed from 90 operators to more than 2000 operators today [11]. It is also an example of the trend of simplifying procedures regarding UA as well as of the mutual influence of the European and member states legislative works.

4. Uavs in European Law

The European Commission published on 7th December 2015 the Aviation Strategy for Europe. One of the areas of actions needed to implement the Strategy's priorities is Embracing a new era of innovation and digital technologies. A vast majority of the document's subchapter concerning this axis of activity is dedicated to drones. [1].

Interestingly, the document itself pays almost no attention to general aviation (GA), concentrating more on commercial air transportation and the aeronautical industry. This is to an extent understandable, as there is a General and Business Aviation Agenda from 2008 [12]. In the Aviation Strategy, the use of UAVs in providing services is stressed, which intersects vastly with aerial works, as described in the General and Business Aviation Agenda. The drafting of the Strategy could have been a good opportunity to analyse the implementation of the GA Agenda and eventually draw conclusions and suggest amendments to the GA Agenda.

In the Aviation Strategy, there are some issues though, that may also be of importance for the GA-sector. In particular, this document calls for shifting to a risk and performance based mind-set and stresses that the European Aviation Safety Agency must be in a position to prepare and conduct certification in a timely and efficient manner, while maintaining its independence and impartiality [1].

A couple days after the Aviation strategy had been published, EASA exposed its Technical Opinion. The Opinion poses 27 concrete proposals for a regulatory framework. Nowadays under art 1 and 4 of Annex II to the Regulation 2016/2008 ('Basic Regulation') [13] EASA is mandated only to regulate UA with the MTOM above 150 kg, so the vast majority of UA fall within the scope of national legislation. This fact on the one hand enables the member states to better suit their regulations to their needs. On the other hand, it poses a distortion for a free movement of products within the EU, one of the fundamental freedoms and of the most important rationale for the creation of the European Community. The regulatory framework will thus need to i.a. amend the Basic Regulation.

According to the Technical Opinion, the future UA-regulations should abide to four principles – they should be 'operation-centric', 'risk based', 'performance based' and 'proportional'. With these 4 principles as the cornerstone, UAVs shall be divided into three categories: 'open', 'specific' and 'certified'. Within the first category a 'harmless' subcategory is to be created.

The Opinion proposes the following ways of ensuring safety of operations for the given categories: 1) 'Open' category (low risk): Safety is ensured through compliance with operational limitations, mass limitations (as a proxy of energy), product safety requirements (to be defined, but the product safety supervision system is founded on Regulation 765/2008/EC [14], and Decision 768/2008/EC [15]) and a minimum set of operational rules. 2) 'Specific' category (medium risk): Authorisation by a National Aviation Authority (NAA), possibly assisted by a Qualified Entity (QE), following a risk assessment performed by the operator. A manual of operations shall list the risk mitigation measures. 3) 'Certified' category (higher risk): Requirements are comparable to those for manned aviation. Oversight is in part to be provided by NAA (issue of licences and approval of maintenance, operations, training, ATM/ANS and aerodromes organisations) and by in part by EASA (design and approval of foreign organisations) [4].

The product safety approach requires dedicated legislation for open and specific category. As opposed to this, no separate Implementing Rules for certified category of UA shall be created, the existing manned IR will be adapted [4].

As to the use of airspace it is worth noticing, that in order to prevent unintended flight outside safe areas and to increase compliance with applicable regulations, a functionality that automatically generates geographical limitations and identification of the unmanned aircraft for certain unmanned aircraft and operation areas should be mandated. The IRs will define the scope of such mandate. For instance, the UAS in the 'open' category shall have a system limiting its performance, so that the aircraft cannot fly above 150 m. [4].

A further point of interest in the Technical Opinion is the proposal of the introduction of a new certificate, i.e. Remote Operator Certificate, ROC, in the certified category [4].

The Technical Opinion is not reluctant to towards allowing the performance of carriage of

person by UA. It reads as follows: This wide definition (of an UA) will allow to establish rules (...) for autonomous aircraft or 'unmanned aircraft' carrying persons. [4] The assumptions and proposals formulated in the Technical Opinion seem in general very sensible. It will be the final shape of the legal regulations, however, that will either boost or hamper the development of drones in the EU. As an example, product safety approach towards the 'open' and 'specific' is in itself correct. If the product safety requirements to be drafted will be too burdensome, the industry will not fully unleash its potential.

5. Uavs in Polish Law

Poland introduced its drone-relevant legislation relatively early, i.e. in 2013. Until the beginning of 2016, there were approximately 2500 certificates of competence for UA-pilot (under Polish legal terminology 'UA-operator') [16] In Poland the relevant pieces of legislation for unmanned aircraft is the Act of 3rd July 2002 – Aviation law [17], as well as 3 regulations of the Minister of Transport, Construction Industry and Maritime Economy: 1) of 26th March 2013 regarding the exclusion of application of some provisions of the act – Aviation law to some kinds of aircraft and stipulating conditions and requirements concerning the use of such aircraft [18]; 2) of 3rd June 2013 regarding the certificates of qualifications [19]; 3) of 26th April 2013 regarding the technical and exploitation provisions concerning the special category aircraft, not supervised by the European Aviation Safety Agency [20].

The two former regulations are now under the revision process. Until now it has not been signed by the Minister [21,22].

The proposal of the certificates of qualification regulation seems to go contrary to global trends in simplifying the drone-relevant legislation, as the proposal excludes the possibility of self-education for Visual Line of Sight (VLOS) competence [22].

With regard to the exclusion regulation, the principles of carrying out VLOS-operations are to be laid down more precisely, especially in the CTR, ADZ, ADIZ zones and above towns with less than 25000 inhabitants [21].

Art. 126 subsection 5 of the Aviation law empowers the Minister to pass a regulation concerning operations Beyond Visual Line of Sight (BVLOS) and the cooperation of its pilots with Air Traffic Services (ATS). Until today such regulation has not been enacted.

In my opinion the lack of this regulation is a major hurdle to further development of the drone industry in Poland.

It is argued that there is little sense in enacting this regulation prior to the EU-wide ones. Yet according to the Roadmap presented in the Technical Opinion, it is not earlier than Q2 of 2017 when such EU-regulations could be passed [4]. If Poland enacted sensible regulations, especially providing for automatic systems of flight plans monitoring and coordination as well as geographical (spatial) limitations system, and taking into account the framework given by the Technical Opinion this could serve as a guidance for the final version of the EU-regulations, giving Polish industry a competitive edge.

Conclusions

The Technical Opinion allows at most instances to take an optimistic perspective. The

proposals of the legal regulations' wordings have not been proposed yet, so there still exist a danger, that the legal provisions will not be as sensible, as the Technical Opinion's. If the operation-centric and the risk-based approach, as unveiled in the Technical Opinion towards unmanned aircraft, prove to be successful, this may trigger a shift in the regulations referring to other categories of aircraft away from the 'classical' approach in European aviation law. The 'classical' perspective dominating the current European law differentiates the requirements principally according to the remuneration element in an operation.

The Aviation strategy stresses that the UA-specific safety and risk issues call for a different regulation approach from the manned aviation, [1]. Yet the lessons to be learned from UA regulations, in my opinion, should have the potential to influence the regulatory approach towards manned aircraft.

The calls from the GA-community for a more proportionate and subsidiary regulations voiced e.g. in a Resolution of the European Parliament of 3 February 2009 on an Agenda for Sustainable Future in General and Business Aviation [23] may – through a 'detour' of unmanned aircraft – find their way into the European regulations of manned aviation.

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