

25th COSCAP-SA STEERING COMMITTEE MEETING

EASA Activities on Unmanned Aircraft (Drones) Information Paper 3 (IP3)

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SUMMARY

A brief summary of the paper

This paper provides an overview of EASA’s activities on unmanned aircraft (drones). It describes the EASA Technical Opinion, the roadmap to roll-out the “operation-centric” concept for an unmanned aircraft regulatory framework, the actions put in place by EASA/the EU and information on how risks will be controlled for the “open” category.

1. Background

EASA published a Technical Opinion on the “Introduction of a regulatory framework for the operation of unmanned aircraft” on 18 December 2015. This was developed in parallel with the draft modifications to EASA’s Basic Regulation and an updated EU Aviation Strategy.

This information paper EASA’s activities on unmanned aircraft and explains the Technical Opinion, the roadmap to roll-out an operation centric concept for an unmanned aircraft regulatory framework, EASA’s cooperation with international organisations, and some safety specific issues.

2. Technical Opinion

The Technical Opinion of 18 December 2015 includes 27 concrete proposals for a regulatory framework and for low-risk operations of all unmanned aircraft irrespective of their maximum certified take-off mass (MTOM). The regulatory framework proposed is operation-centric, proportionate, risk- and performance-based, and establishes three categories as follows:

- *‘Open’ category* (low risk): Safety is ensured through compliance with operational limitations, mass limitations as a proxy of energy, product safety requirements and a minimum set of operational rules.
- *‘Specific’ category* (medium risk): Authorisation by a National Aviation Authority (NAA) following a risk assessment performed by the operator. A operations manual lists the risk mitigation measures.

- *'Certified' category* (higher risk): Requirements comparable to those for manned aviation. Oversight by NAAs (issue of licences and approval of maintenance, operations, training, ATM/ANS and aerodromes organisations) and by EASA (design and approval of foreign organisations).

With reference to mass-produced unmanned aircraft whose operation is considered to pose a low risk, it is proposed to use existing market surveillance mechanisms¹ specifically devised for the production and marketing of such type of products. However, national aviation authorities remain indirectly involved even in this case, as the operational capability limitations that would be imposed (e.g. that these unmanned aircraft should not fly higher than, for instance, 50m to keep risks low) will have to stem directly from the traditional aviation safety requirements.

3. Roadmap

The proposed changes to EASA's Basic Regulation envisage that all unmanned aircraft will be covered by the EU/EASA. A roadmap is being developed to provide clarity on how these legal changes will be used. The roadmap describes how drones could be safely operated in European airspace and how an operation-centric approach will be rolled out in the EU in the coming years to maintain high levels of safety, privacy, data protection, security, and environmental protection while fostering innovation and growth.

The roadmap addresses:

- Rulemaking
- Development of standards
- Research
- International cooperation
- Organisation of airspace for low-level operations
- Liaison with state aircraft, and
- Communications.

Its annexes list the actions that will be undertaken over the coming years.

During meetings with European Member States, it became clear that there was a need for EASA to quickly draft "prototype" rules for the open and specific categories. EASA has committed to produce such prototype rules by the end of July 2016.

¹ As governed by Regulation (EC) No 765/2008 and Decision No 768/2008/EC

4. Cooperation with International Organisations

EASA's international cooperation on drones focuses on active involvement in two bodies: ICAO and JARUS.

For ICAO, the starting point is Article 8 of the Chicago Convention. This article by and large prevents the international circulation of drones except when the Contracting State concerned has issued a specific authorisation. ICAO has been working on drones (duly called "remotely piloted aircraft systems" or RPAS) since 2003. ICAO is currently running a specific drone panel that should eventually lead to guidance and standards. The challenge is to reconcile the traditional ICAO approach (aircraft-centric licensing and certification) and remit (international transport flying under "instrument flying rules") with the flexible approach that is more appropriate to the small drone market (the operations-centric approach).

Smaller drones are not engaged in international transport and raise issues beyond safety, such as privacy and data protection. However it is generally expected that drone operations will eventually engage in international transport. Hence the need to work towards the adoption of rules that will support the development of a legal framework in the ICAO contracting states. Europe will invite ICAO, in the longer term to develop a global framework for smaller drones to ensure global consistency on the basis of the work undertaken by the Joint Authorities for Rulemaking on Unmanned Systems (JARUS). In the meantime, ICAO is invited to assess potential limitations to drone operations and focus on new challenges such as liability, airspace, technological, security and legal aspects.

At the last ICAO RPAS panel meeting in March, EASA proposed and it was agreed that it would draft the Annex for unmanned aircraft operations. ICAO has also set-up a Small Unmanned Aircraft System Advisory Group (SUAS-WG) which will propose the set-up of a website providing guidance for Contracting States.

JARUS is a cooperation of (currently) 45 civil aviation authorities worldwide (including India) and its aim is to develop harmonised rules for unmanned aircraft recommending a set of technical, safety and operational requirements for the certification and safe integration of drones into airspace and at aerodromes. This could contribute to harmonisation worldwide in line with ICAO's work.

From the last plenary meeting results, it is clear that JARUS's work is progressing quite quickly. All the groups are very committed. The following key deliverables are either ready for external consultation or soon will be:

- The (A)TM Concept of Operations – external consultation expected soon
- The risk assessment methodology for the B category (Specific to EASA) – SORA (Specific Operations Risk Assessment) – external consultation expected after summer
- The Command and Control Concept of Operations
- The DAA (Detect and Avoid) Concept of Operations – external consultation expected after summer

By mid-2017 all the necessary concepts and regulatory material for the open and specific categories should have been published for consultation.

In addition to cooperation with ICAO and JARUS, EASA maintains a ready link of communication with the FAA to exchange information and, as appropriate, participate in FAA activities (e.g. participation in the Aviation Rulemaking Committee on Micro Unmanned Aircraft).

5. Research

A lot of aviation research is ongoing within Europe and across the world supported by EU funds, although currently in a scattered manner. R&D efforts focus on technologies that make drones emulate manned aircraft, such as detect and avoid, command and control, airport operations, airspace access, and contingency and security including cyber-resilience.

Examples include:

- The Single European Sky ATM Research (SESAR) joint undertaking is focusing on air traffic integration;
- The Joint Research Centre (JRC) is carrying out research on smaller RPAS focusing on identification and GEO fencing;
- Under the EU's Horizon 2020 Programme, several projects are taking place in the field of drones;
- The European Defence Agency, the military and national institutes have several initiatives running.

6. Specific safety issues

6.1 Safety of the Open category

The level of safety posed by the open category has been put in question by recent events. The necessary safety level as envisaged by the Technical Opinion will be achieved by using safety measures across several domains:

Operational limitations and rules

- Maximum altitude (150m) and distance from uninvolved people (50m)
- Establishment of no-drone zones (to exclude operation in the vicinity of airports, as well as any other zone which local authorities identify as forbidden for drones operation)
- Operations only in Visual Line Of Sight (VLOS)
- No flights over crowds
- Adequate Pilot competence (e-learning)

Compliance with product requirements (technological measures)

- Limitations of the drone's performance (including mass and depending on pilot competence level)
- Insertion of specific functionalities to reduce risks: identification and geo-limitation
- Inclusion of design characteristics (for example with regard to loss of link) to reduce the risk to an acceptable level

Awareness raising

- Promoting knowledge of the rules

Efficient enforcement

- Mandatory registration

In addition, EASA has launched a task force on Geo-limitation with the participation of four European Member States². This will produce a report with a set of recommendations and the way forward to implement them, focusing on unmanned aircraft in the "Open" category and on the risk of conflict with other airspace users (in particular, Commercial Air Transport).

EASA is also studying the issue of the impact of an unmanned aircraft with manned aircraft (large aeroplanes, rotorcraft, General Aviation). A taskforce composed of EASA and aircraft and engines manufacturer representatives has been set up to:

- Review all relevant occurrences (including the occurrences collected by the European Member States),
- Analyse the existing studies on the subject of impact between drones and aircraft,
- Study the vulnerabilities of aircraft (windshields, engines, and airframe) taking into account the different categories of aircraft (large aeroplanes, general aviation, and helicopters) and their associated design and operational requirements,
- Consider the possibility to do further research and perform actual tests (for example on windshields).

This will publish its results and organise a workshop with stakeholders to present and discuss its findings and recommendations at the end of July 2016.

6.2 Unmanned aircraft traffic management

The development of an unmanned aircraft traffic management concept of operations is a key issue for the development of unmanned aircraft operations. Several models have been proposed by NASA, Google and Amazon to name just a few. The approach to low-level operations cannot be based on classical ATM. An (A)TM concept of operations has been

² Finland, France, Poland, United Kingdom

proposed within JARUS; JARUS's internal consultation was scheduled to have ended in June 2016.

6.3 Occurrence reporting

Safety requires data and EASA is developing an Unmanned Aircraft Safety Risk Portfolio. The existing Network of Analysts (NoA) is continually monitoring occurrences involving unmanned aircraft. Existing occurrence reporting regulations will need to be complemented when all RPAS are in EU rules. EASA is already collating and analysing the data it already has in preparation for the wider implications once the regulations are adopted.

7. Conclusions

The development of a regulatory framework for unmanned aircraft is urgently needed. It must be proportionate, risk based and performance based. EASA is actively involved and engaging its resources. The priorities are being defined in line with the development of its roadmap.

EASA's objective is to develop a regulatory framework for unmanned aircraft in an open, proportionate, transparent and timely manner together with all relevant stakeholders, whose input is important in order to ensure evidence-based policy making.