



EASA

European Aviation Safety Agency

Introduction of a regulatory framework for the operation of drones in the open and specific category

Presentation to
ICAO 2nd RPAS Symposium
19 September 2017

EASA drone team
Presented by Y Morier

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An agency of the European Union 

TE.GEN.00409-001



Draft revised Basic Regulation envisages that all UAS are under EU competence

- Regulatory concept: Operation centric; proportionate; performance and risk based



OPEN:

Low risk

Competent Authority notified by Member States; no-pre approval envisaged

Limitations (25 kg; Visual line of sight (VLOS), Maximum height; system of zones)

Rules: no flight over crowds, pilot competence

CE marking allows for design requirements

Sub-categories including toys

SPECIFIC

Increased risk

Authorisation by NAA based on Specific Operation Risk assessment (SORA)

Standard scenarios either with declaration or authorisation

Optional concept of approved operator with privilege

CERTIFIED

Regulatory regime similar to manned aviation

Certified operations to be defined by implementing rules

Certified means certified UAS and certified operator and licenced pilot (?)

Pending criteria definition, EASA accepts application in its present remit

Some systems (Datalink, Detect and Avoid, ...) may receive an independent approval



Overview of NPA open and specific: General



European Aviation Safety Agency

Notice of Proposed Amendment 2017-05 (A)

Introduction of a regulatory framework for the operation of drones

Unmanned aircraft system operations in the open and specific category
RMT.0230

EXECUTIVE SUMMARY

In accordance with Regulation (EC) No 216/2008 (hereinafter referred to as the 'Basic Regulation'), the regulation of unmanned aircraft systems (UAS) with a maximum take-off mass (MTOM) of less than 150 kg falls within the competence of the European Union (EU) Member States (MSs). This leads to a fragmented regulatory system hampering the development of a single EU market for UAS and cross-border UAS operations. A new proposed Basic Regulation (hereinafter referred to as 'the new Basic Regulation'), currently under discussion between the Council, the European Commission, and the European Parliament, aims to

Cover regulation:

Article 1 Subject matter and scope

Article 2: Definitions

Article 3: principles applicable to all UAS operations

Article 4: Open category UAS operations

Article 5: Specific category UAS operations

Article 6: Designation of the competent authority (Aviation)

Article 7: Responsibilities of the competent authority (Aviation)

Article 8: Designation and responsibilities of the market surveillance authority

Article 9: Exchange of Safety Information

Article 10: Third Country UAS operators

Article 11: Means of Compliance

Article 12: Airspace Areas and Special Zones for UAS Operations

Article 13: Exchange of information and safety measures

Article 14: UAS operations conducted in the framework of model clubs and associations

Article 15: Applicability

Article 16: Entry into Force and application

Plus two annexes 1. UAS and 2.MKT

Some key points:

- Responsibilities of operator and pilots defined,
- Registration of operators and UAS with some exceptions,
- e-identification on some UAS
- geo-fencing on some UAS
- Use of product legislation (making available on the market) for technical requirements for the UAS (CE marking)
- **Contribute to security and privacy**
- Several authorities involved in UAS in Member States
- Autonomy is addressed in Specific category
- Cover also model aircraft
- Does not apply to in-door operations



Overview of NPA: open and specific categories



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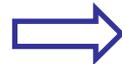
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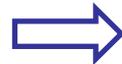
Article 3: Principles applicable to all UAS operations

Article 4: Open Category



Subpart A

Article 5: Specific Category



Subpart B

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Subcategories

A1: Fly over people

A2: Fly close to people

A3: Fly far from people

No pre authorisation required

Risk Assessment

Standard Scenarios

LUC

Mutual Recognition

Low risk

Declaration

High risk

Authorisation

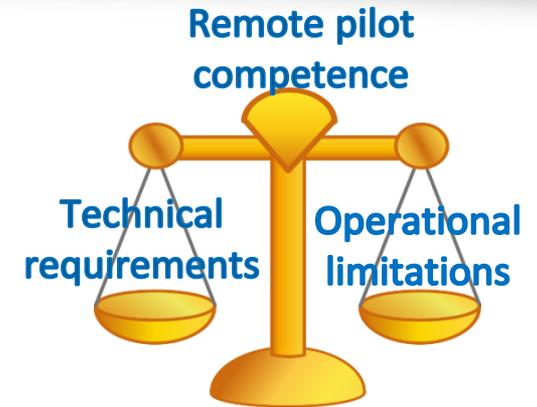
Light Operator Certificate: Privileges to self authorise operations in specific category (Subpart C)



Inherent Safety Risk of an operation

Unmanned aircraft pose 2 kind of risks:

- **Ground risk:** for people and critical infrastructure
- **Air risk:** mid-air collision with manned aircrafts



Open category

Main operational limitations

Height < 120 m

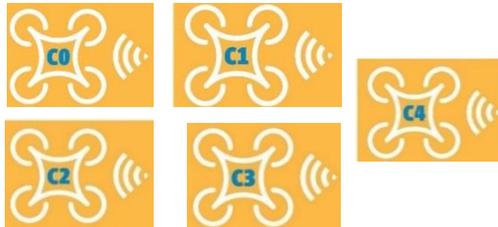
Weight < 25Kg

VLOS



Technical requirements

5 classes (C0-C4)



Remote pilot competence

Leaflet

Online training

Certificate of competence



Leaflet

Basic information on how to operate a UAS summarised in a leaflet provided by manufacturer in the drone package



Homebuilt drones can be used within defined limitations



Specific category: risk assessment

- Specific category:
 - Risk assessment or standard scenarios define mitigating measures:



- Pilot competence is part of the risk assessment



Overview of NPA: flexibility for Member States



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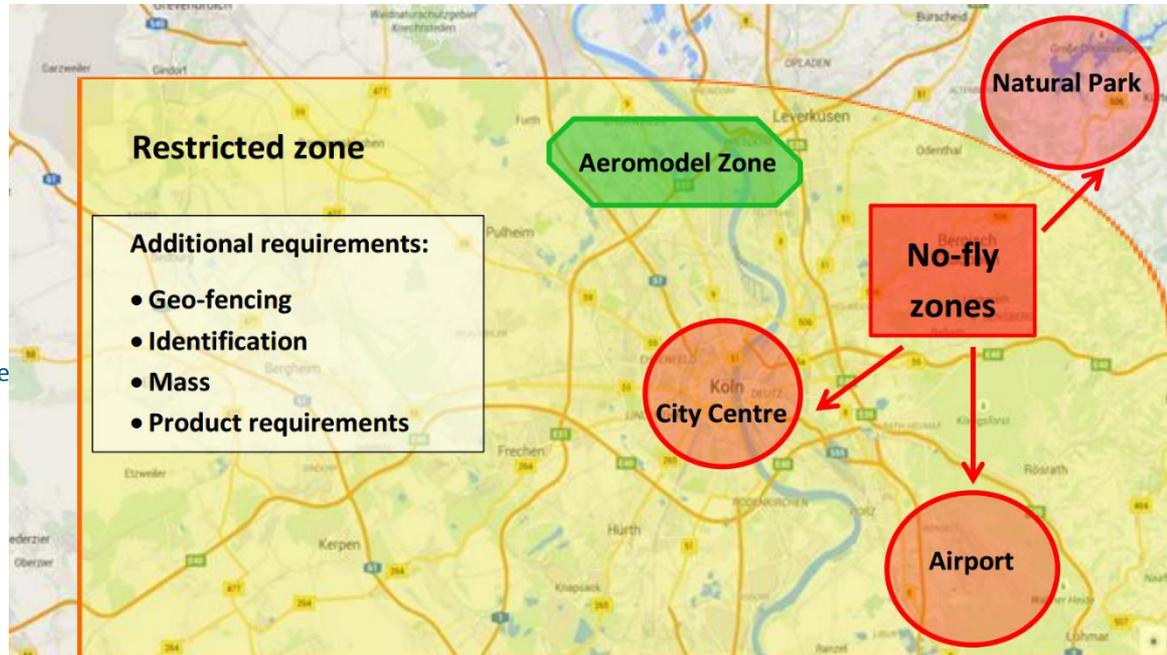
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Defined by Member States



Overview of NPA: Applicability



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Assuming that new Basic Regulation will be adopted by the end of 2017

Adoption of EU regulation

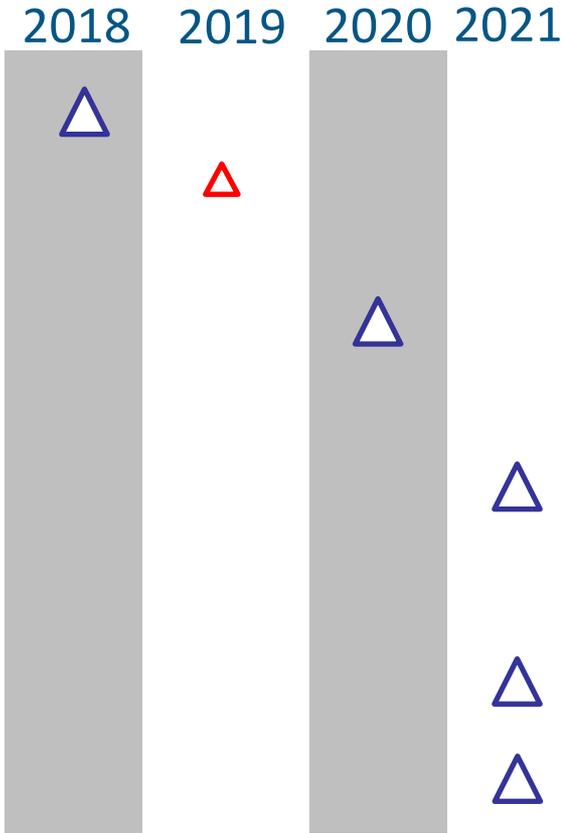
(Implementation of U-space Phase 1)

UAS on the market comply with EU regulation

All UAS operated according to EU regulation*

UAS operator convert existing authorisations

MS publishes zones



*After 2021 legacy UAS are considered equivalent to homebuilt



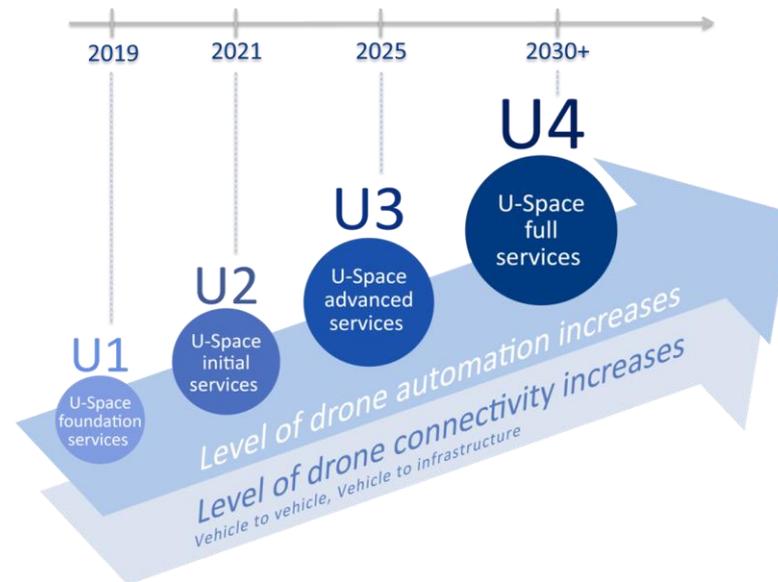
Planned regulatory work

- Categories open and specific
 - Consultation period ended on 15 September;
 - Workshop held on July 5
 - Opinion: planned for January 2018;
 - Adoption of regulation depending on adoption of the Draft BR
- Next activities:
 - Development of Standard supporting technical requirements
 - Category certified: NPA planned for Q1 2018
 - Standard scenarios for specific category planned for Q2 2018
 - CS-UAS planned for Q1 2019



• U-space and ATM master plan

- Cooperation with EC, EDA, EUROCONTROL and SJU
- Set of services, high level of digitalisation and Automation;
- Adoption end of the year of an addendum to the ATM master plan
- U-Space a reality by 2019 with a step by step approach:
 - Registration, E-identification, Geo-fencing are the 3 pillars in 2019



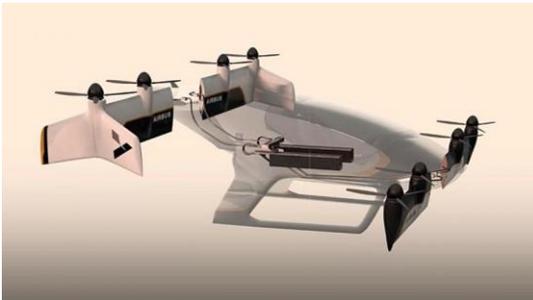


Other activities

- Strong Cooperation with EC, Member States and Stakeholders:
 - E.g. Rulemaking, development of standards
- International cooperation:
 - Active participation to ICAO and JARUS; close contacts with FAA
- Safety promotion: in addition to leaflets
 - Survey of ECAC Member States activities
 - preparing a European UAS safety promotion campaign
- On-going certification of 5 projects
- Dual-Use UAS:
 - cooperation with EDA and several military airworthiness authorities
- Research:
 - Cooperation with EDA and SJU (e.g. support to their projects)
 - Definition of a research programme for the UAS-manned aircraft collisions



Urban mobility : EASA-NAA cooperation needed



- Performance based; risk based holistic approach
- How to proceed when rules are not available?
- Technical challenges:
 - Batteries: Power to weight/ volume ratio, endurance; availability of necessary metals, fire, charge, replacement; disposal.
 - Role of the human : competencies; autonomy; artificial intelligence; ethics:
 - Integration of mobility projects in the airspace and platform in cities
 - Cybersecurity
 - Noise physically less but issue of perception



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Questions

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Back Up

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List of Acronyms

- ASD: Organization representing European Aeronautics, Space and Defence Industry
- ASTM: American Society for Testing and Materials (US Standardization Organization)
- CE: Conformité Européenne
- CS-UAS: Certification Specification-Unmanned Aircraft Systems
- C2: Command and Control
- D&A: Detect and Avoid
- ECAC: European Civil Aviation Conference
- EDA: Europe Defence Agency
- FAA: Federal Aviation Administration
- FCL: Flight Crew License
- ICAO: International Civil Aviation Organization
- KE: Kinetic Energy
- MP: MegaPixels
- MS: Member States
- NAA: National Aviation Authority
- NPA: Notice of Proposed Amendment
- RIA: Regulatory Impact Assessment
- SAE: Society of Automotive Engineers
- SJU: SESAR Joint Undertaking
- UA: Unmanned Aircraft
- UAS: Unmanned Air System



Certified category: first considerations

- ‘certified category’ means a category of UAS operation that, considering the risks involved, requires the certification of the UA, of its operator and licensing of the flight crew;
 - Some examples of certified category of operation are:
 - large or complex UAS operating continuously over open assemblies of people;
 - large or complex UAS operating BVLOS in high-density airspace;
 - UAS used for transport of people; and
 - UAS used for the carriage of dangerous goods, which may result in high risk for third-parties in case of crash.
- two possible approaches:
 - Set of NPAs affecting many rules OR Stand-alone rule



Open Category: "Buy&Fly" (observing the rules)

UAS subcategory	UAS class	MTOM/ Joule (J)	Distance from people	Maximum height of the operation	Remote-pilot competence	Age of the remote pilot	Main technical requirements (CE marking)	UAS registration	Electronic identification (EI), geofencing (G)
A1 Fly over people	Privately built	< 250 g	Fly over uninvolved people (not over assemblies of people)	< 50 m	Leaflet	No limitation	N/a	No	No
	C0						Toy regulation, no sharp edges, awareness leaflet		
	C1	< 80 J or 900 g					< 120 m or up to 50 m above a higher obstacle, at the request of the owner of the object		
A2 Fly close to people	C2	< 4 kg	Fly intentionally in proximity to but at a safe distance from uninvolved people (> 20 m for rotorcraft UAS or > 50 m for fixed-wing UAS)	< 120 m or up to 50 m above a higher obstacle, at the request of the owner of the object	Leaflet plus certificate of competence (theoretical qualification) and exam in an approved centre	16 years or with supervisor	Mechanical strength, lost-link management, selectable height limit, awareness leaflet	Operator and UA	Yes
A3 Fly far from people	C3	< 25 kg	Fly in an area where it is reasonably expected that no uninvolved person will be present	< 120 m or up to 50 m above a higher obstacle, at the request of the owner of the object	Leaflet plus online training with a test	16 years or with supervisor	Lost-link management, selectable height limit, awareness leaflet	Operator and UA	If required by the zone of operations
	C4		In addition to the above, keep a safety distance from the boundaries of congested areas of cities, towns or settlements, or aerodromes				Operational instructions, awareness leaflet		
	Privately built						N/a		