



Ensuring safe, secure and efficient drone operations The European Drone and U-space regulatory framework

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An Agency of the European Union 

EASA UAS Categories of Operation



OPEN category - Low risk

NO-PRE APPROVAL

LIMITATIONS: 25 kg, Visual Line of Sight (VLOS), height <120m, system of zones

3 Sub-categories: fly over, close, far from people

General public / recreational purpose

Model Flying, Photographers

SPECIFIC - Increased risk

Authorisation by NAA based on specific operation risk assessment (SORA)

Declaration in case of standard scenario; LUC

BVLOS operations (linear inspections, aerial work, ...)

Transport of goods

CERTIFIED - Risk as manned aviation

Certification of UAS [by EASA], approval of the operator and licensed pilot (unless autonomous flight) [by the NAAs]

*Air Taxi
International IFR (cargo, passengers)
Package delivery over people*

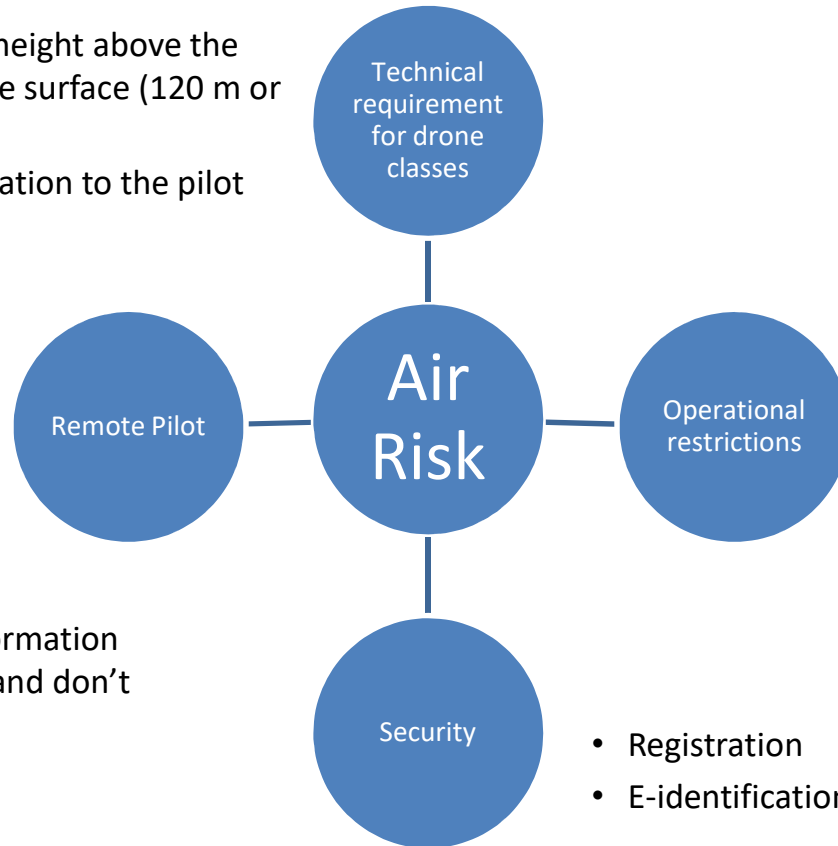
Status of EU Regulation for Drones

- [Commission Delegated Regulation \(EU\) 2019/945](#) & [Commission Implementing Regulation \(EU\) 2019/947](#):
 - Published on 11th of June, 2019
 - Entered into force on 1st July 2019
- Implementing act (EU) 2019/947
 - Requirements related to operation and registration for the Open and Specific categories of operation
- Delegated act (EU) 2019/945
 - Requirements related to CE marking and technical requirements for drones of the Open category of operation
 - Requirements for third-country operators



Addressing Air Risk in the Open category

- Maximum attainable height above the take-off point or above surface (120 m or selectable)
- Provide height information to the pilot
- Geo-awareness
- Lights



- Competences
- Minimum Age
- Consumer information including dos and don't

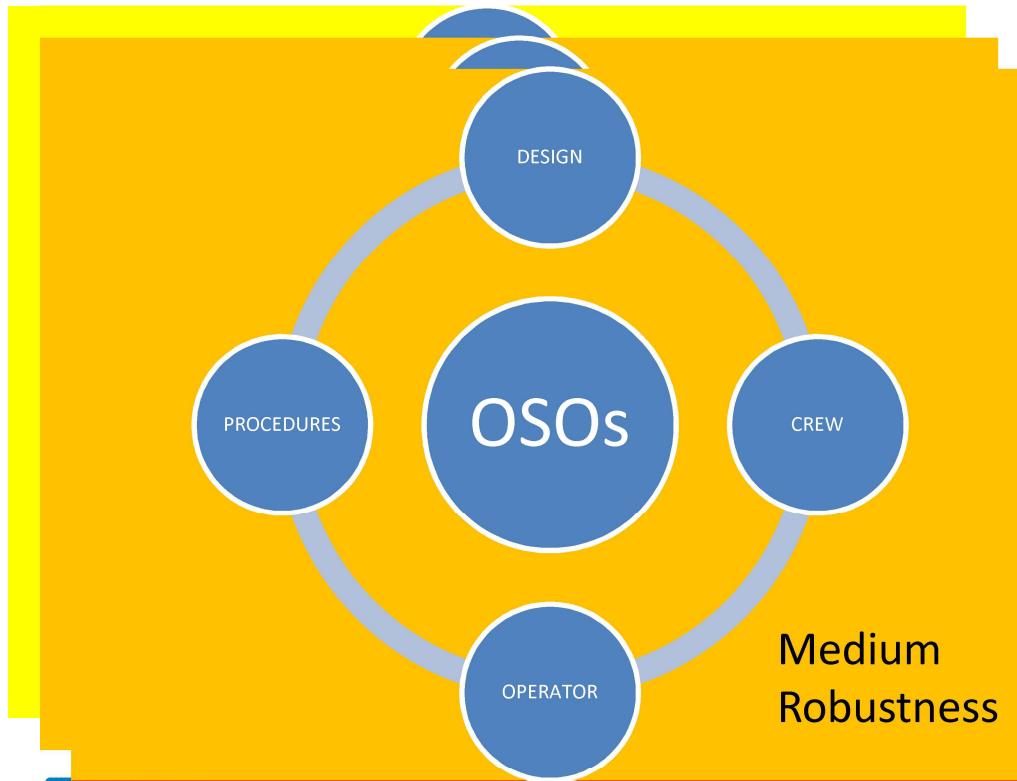
- Only VLOS
- Fly far away from aerodromes
- Fly below 120 m from ground / surface
- Set-up of no-drone zones / limited drone zones

- Registration
- E-identification

Addressing Air Risk in the Specific category

- SERA Regulation requires all aircraft, manned and UAS, to “remain well clear from and avoid collisions with’ other manned aircraft”
- A UAS operated in BVLOS is, in general, unable to ‘see and avoid’ (at least until fully certified cooperative and uncooperative DAA will be available)
 - Need of “alt-moc” for accommodation in non segregated airspace
 - “Accommodation”
 - *“condition when an RPAS can operate along with some level of adaptation or support that compensates for its inability to comply within existing operational constructs”*
- As per ED Decision 2019/021/R “AMC and GM to Commission Implementing Regulation (EU) 2019/947” the methodology to conduct a risk assessment for authorization of operations in the specific category is basically the JARUS SORA
 - Yields requirements in the form of 24 Operational Safety Objectives (OSO) with robustness level which depends on a Specific Assurance Integrity Level (SAIL) identified by the residual ground and air risk after **mitigations** are applied
 - Residual air risk addressed with **tactical mitigation means**

Addressing Air Risk in the Specific category



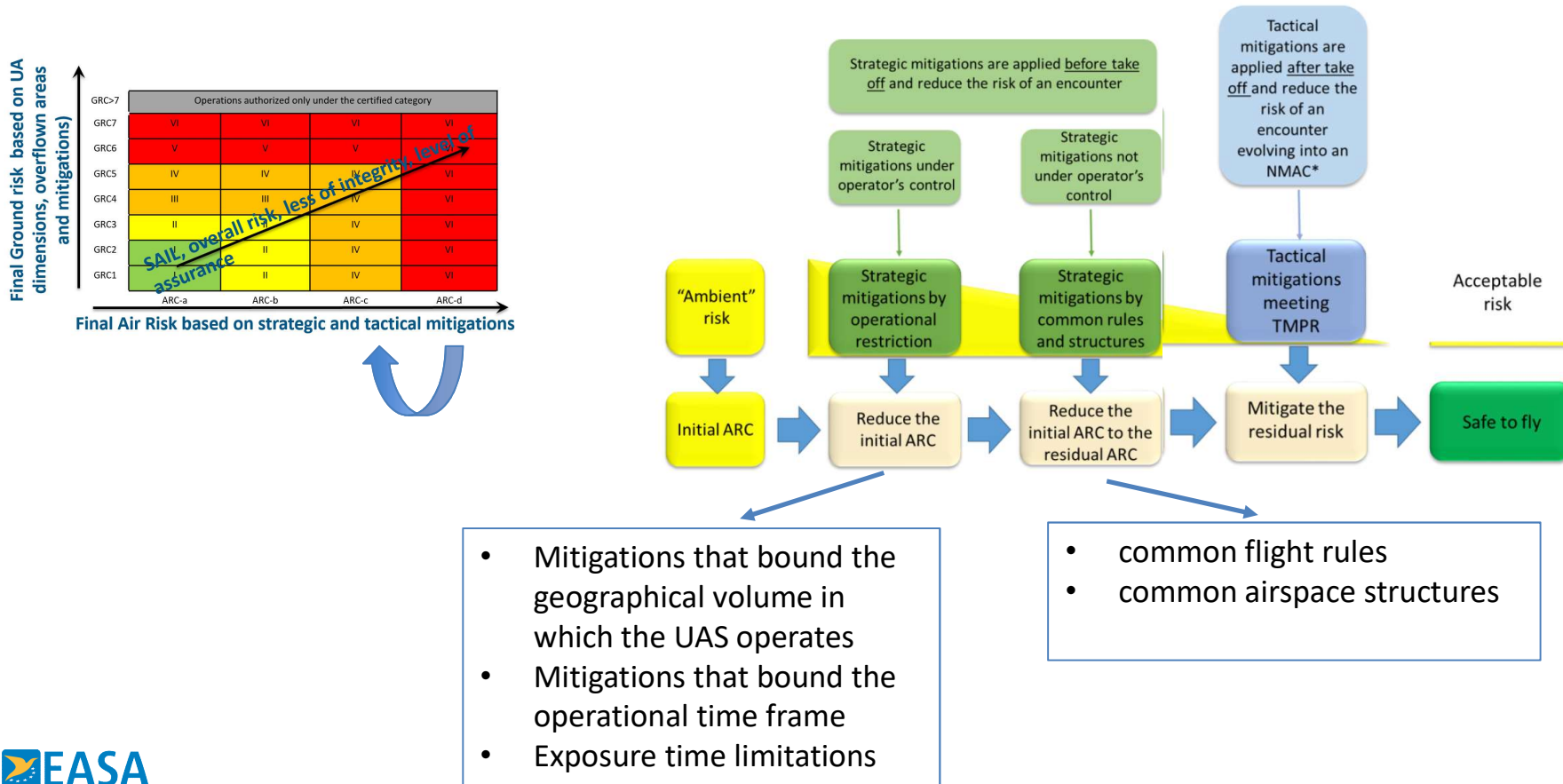
Final Air Risk based on strategic and tactical mitigations

GRC>7	Operations authorized only under the certified category			
GRC7	VI	VI	VI	VI
GRC6	V	V	V	VI
GRC5	IV	IV	IV	VI
GRC4	III	III	IV	VI
GRC3	II	IV	IV	VI
GRC2	II	IV	IV	VI
GRC1	II	IV	IV	VI
	ARC-a	ARC-b	ARC-c	ARC-d

SAIL, overall risk, less of integrity, level of assurance

MA1

Addressing Air Risk in the Specific category

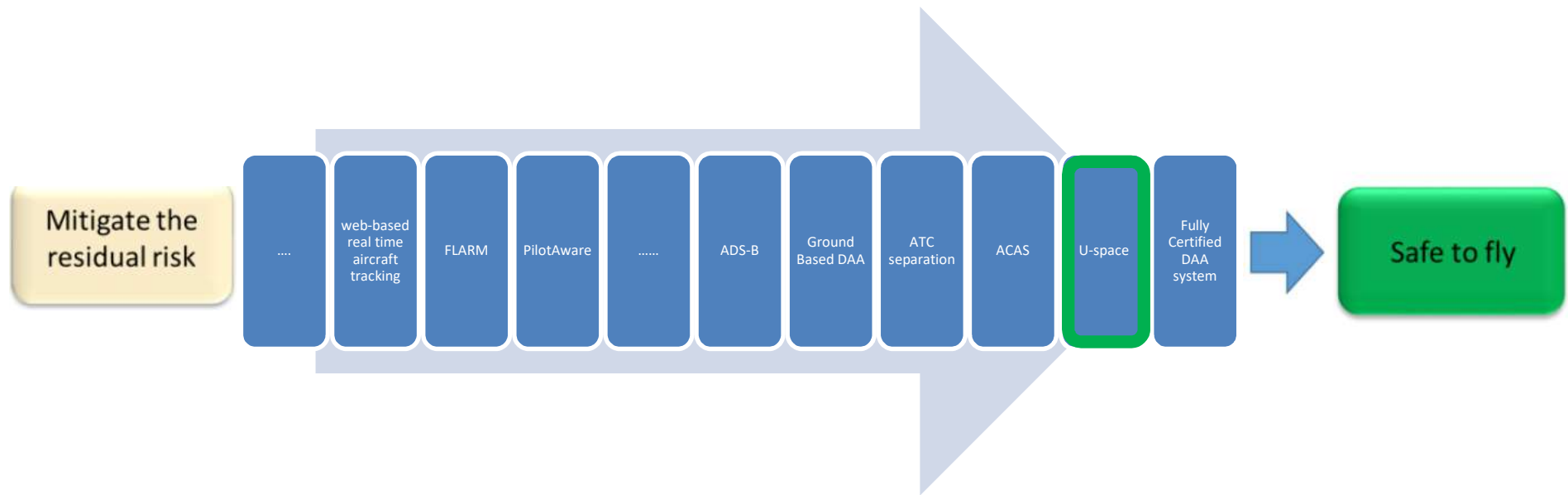


Slide 7

MA1

MARCHETTO Antonio, 10/11/2019

Addressing Air Risk in the Specific category



Mandate for U-space regulation

Amsterdam HLC Declaration on Drones 28 November 2018

- Invited EC and EASA to develop, **as a matter of urgency**, an institutional, regulatory and architectural framework for a competitive U-space services market.

Following the HLC Declaration **EASA/EC have set up a working group** composed of experts from Member States, EUROCONTROL & SESARJU.

The pressing deadline imposed

- limited working group
- focused consultation
- no possibility to wait for future JARUS inputs (if any)



- 7 Member States
- EUROCONTROL
- SESARJU
- EASA team

U-space DRAFT Opinion

Note: all the following slides about U-space address the draft Opinion (not the final after consultation)

U-space Concept

→ Airspace structure/volume designated by the MS where U-space services are provided

- E-identification
- Geo-awareness
- Traffic information
- Flight authorisation
- Tracking
- Weather
- ...

Building blocks

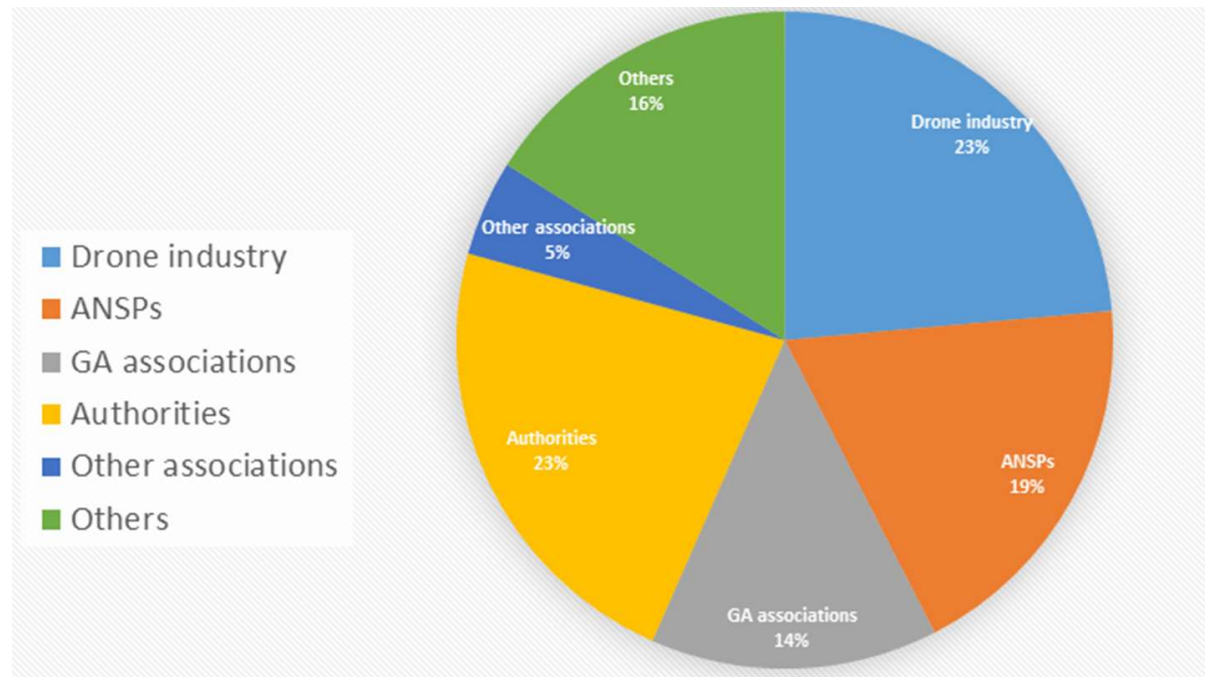


Draft Regulation Status and next steps

- 8 chapters and 28 articles
- End of Opinion consultation: 30 October 2019
- Assessment of comments
- Review draft regulation and update draft opinion
- Internal EASA review (legal + proofreading)
- Final opinion (Q1 2020)
- AMC/GM to be drafted later in 2020

Consultation Outcome

About 2500 comments from 84 stakeholders



Objective: High-level regulatory framework

- A **first step** for timely delivery of rules for U-space;
- Definition of the building blocks;
- Accommodation of initial operations in the **short term**
- Means to **mitigate the risk of collisions** by requiring adapted services and sharing traffic information
 - based on strategic and pre-tactical de-confliction techniques

Scope of the Regulation – Article 1

→ To cover **all actors** involved in the U-space

→ Member States / Competent authorities

→ U-space service providers

→ UAS operators

→ Manned aircraft operators

→ **Out of the scope:**

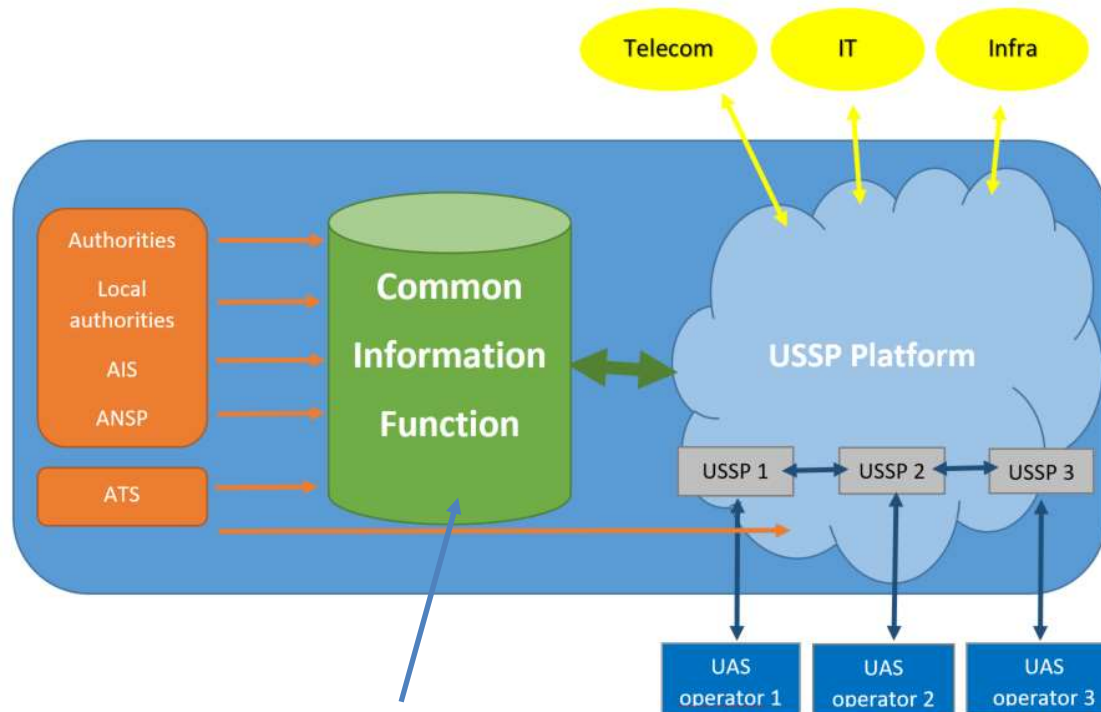
→ Toy aircraft

→ UAS Operations within model aircraft club/associations

Building blocks



The U-space system – general overview



The USSP platform enables the exchange of data and information and connect multiple U-space service providers operating in the same U-space airspace

Repository of all necessary static and dynamic data
Open protocol to access information

Who does what in the U-space system

- **Member States:**
 - Designation of U-space as restricted areas
 - “restricted”: in accordance with specified conditions, as per definition of EU regulation on the flexible use of airspace
 - Designation of the competent authorities to implement the regulation
 - Definition of mandatory U-space services for each volume of airspace designated as U-space
 - Establishment of a Common Information Function for each volume of airspace designated as U-space
- **Competent authorities** are responsible for certification/oversight of U-space service providers
 - **The Agency shall act as the competent authority for U-space service providers providing U-space services in more than one Member State and for U-space service providers established outside EU and providing services within its territory**

Who does what in the U-space system

→ U-space service providers:

- Provide the services
- Establish and maintain the platform
- Obtain / provide data from / to the Common Information Function
- Adhere to the open communication protocol
- Provide occurrence reporting
- Establish service level agreements with UAS operators/other USSP

→ UAS operators:

- Establish service level agreements with USSP
- Submit a flight plan
- Are identified with a unique identifier (“network” E-ident)
- Comply with instructions given by USSP
- Are connected and exchange information through the platform
- Provide access to the registration information

Flight Rules

- During the consultation, the aviation community expressed the need to develop flight rules adapted to UAS operations
 - The working group acknowledged that not all provisions of SERA (standardized European Rules of the Air), e.g. VFR and IFR, ATS rules and procedures, loss communication procedures, separation minima, ... can be applicable as such to UAS operations
- The limited time frame did not allow for the development of amendments to SERA
 - Planned as part of upcoming rulemaking activity
- Some priority rules inserted in the draft opinion

Priority Rules

1. When conducting special operations (in the meaning of EU 923/2012) manned aircraft shall have priority over unmanned aircraft;
2. When conducting special operations, unmanned aircraft shall have priority over any other air traffic;
3. Aircraft carrying passengers shall have priority over aircraft without passengers on board;
4. Manned aircraft shall have priority over unmanned aircraft;
5. BVLOS operations shall have priority over VLOS operations

Certified category: NPA#1 scope and use of U-space



Operations type #1: IFR operations of certified UAS cargo flying in airspace classes A-C and taking-off and landing at aerodromes under EASA's scope.

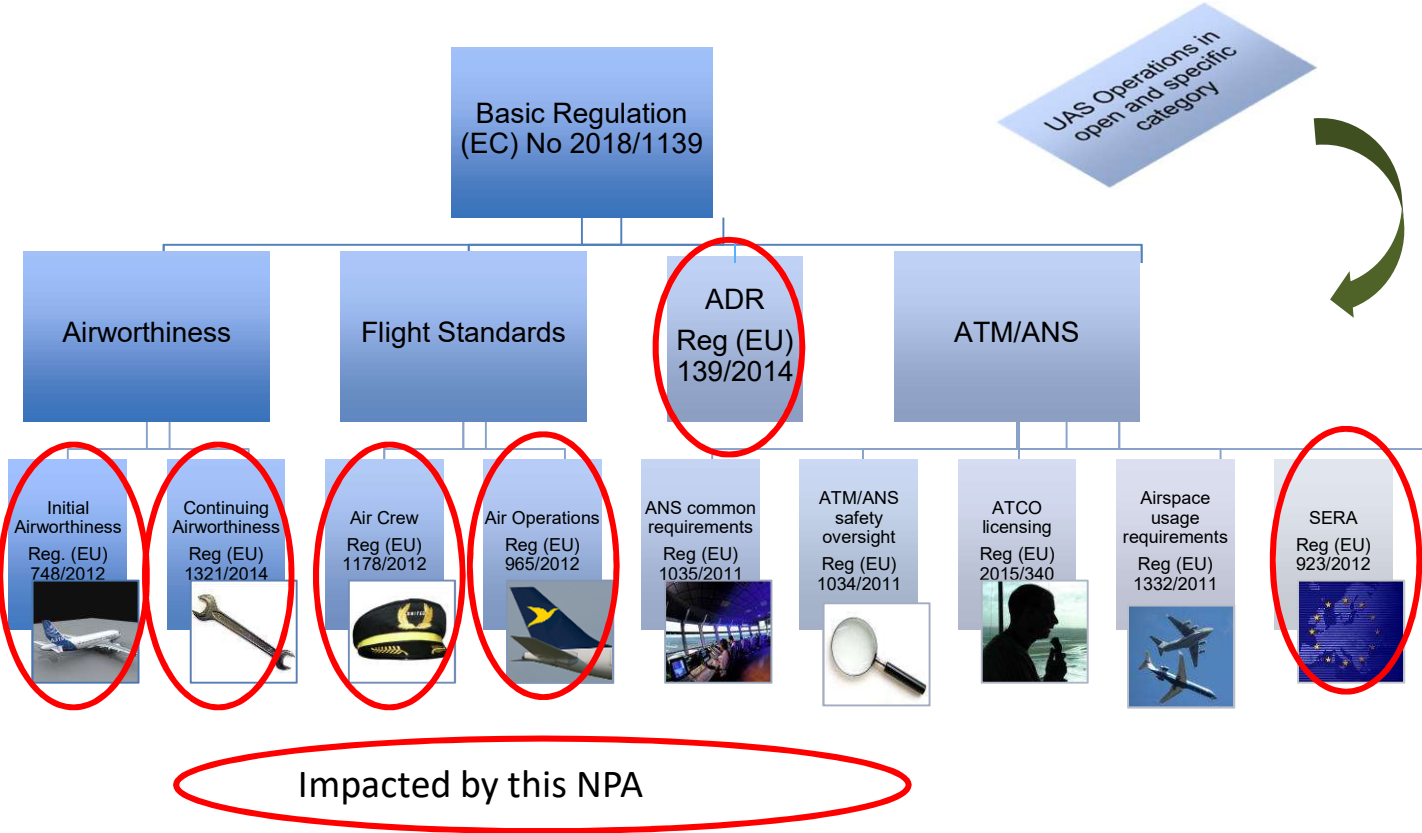


Operations type #2: UAS Operations in congested (e.g. urban) or non-congested (e.g. rural) environment using pre-defined routes in volume of airspaces where U-space services are provided. This includes operations of unmanned automation system – based aircraft (ASBA), carrying passengers (e.g. VTOL air taxis) or cargo.



Operations type #3: Operations as in type #2 conducted with manned VTOL, also in airspace where U-space is not available

Which regulations NPA#1 will affect



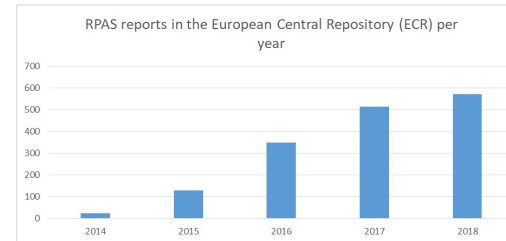
Counter Drone Action Plan

- EASA C-UAS action plan released at Issue 2 in July 2019 with 5 actions
 - Launched:
 1. Geographical zones
 2. C-UAS technologies
 3. Occurrence reporting
 - Planned to be launched by the end of the year:
 4. Roles and responsibilities in case unauthorized drones are detected around ADR
 5. Gathering state-of-the-art data relevant to the consequences of a drone collision with manned aircraft

Research on drone collision with aircraft

- Although the new EASA regulatory framework includes measures to address air risk, such risk will still be present, especially considering the growing number of small drones being operated by the general public

- Airprox related to drones increase year by year and the effect of potential airborne collision between a UAS and a manned aircraft is a concern at all levels



- Additionally, malicious drone use can hardly be prevented with operational restrictions, remote pilot preparation and product requirements
 - The tender for the research project “**vulnerability of manned aircraft to drone strikes**” (H2020 delegated funds) has been launched on 27.09.2019 to finally reach validated results with regard to the outcome, at local and aircraft level, of collision events
 - <https://ted.europa.eu/TED/notice/udl?uri=TED:NOTICE:453363-2019:TEXT:EN:HTML>





Thank you for your attention

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