360 DRONES

DRONES 360

FOSTERING INNOVATION AND BETTER SKILLS MATCH WITH THE GREEN AND DIGITAL SECTORS THROUGH THE INTEGRATION OF EMERGING TECHNOLOGIES (DRONES, VR, AR) IN VET

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WP2: DRONES360 CERTIFIED DRONE PILOT E-GUIDEBOOK

A4. E-Guidebook showcasing a certification procedure for becoming a Certified Drone Pilot.

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1. Introduction

Since time immemorial, man, inspired by the possibilities of birds, has dreamed of flying. Never has the possibility of seeing the world from above been as easy to realize as it is today.

After airplanes, gliders and helicopters, man invented drones.

Drones, which are used in almost all areas of life, have become an essential tool to make life easier. Their use has made many tasks safer, simpler and possible. They enable us to reach and explore inaccessible and hazardous places. Thanks to miniaturization and advances in technology, they carry multispectral, hyperspectral, thermal imaging and lidar cameras. Software that works with them gives the ability to create 2D and 3D models. Gaining the ability to operate UAVs opens up new opportunities for those using them in their work.

The growing interest in the use of unmanned aircraft has prompted the European Union Aviation Safety Agency (EASA) to attempt to unify drone regulations, ensuring uniformity across European Union countries. The result of these efforts is the provisions of the COMMISSION'S EXECUTIVE REGULATION (EU) 2019/947 of May 24, 2019, and the COMMISSION'S DELEGATED REGULATION (EU) 2019/945 of March 12, 2019, discussed in this paper.

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1.1 Types and categories of drones

Drones are flying devices controlled by radio waves.
Unmanned aerial vehicles are:

1. Multirotors (MR) - as the name suggests, multirotors are drones that have multiple rotors. Depending on their number, we can distinguish: quadrocopters, hexacopters, and octocopters. The advantages are stability, manoeuvrability and simplicity of construction. The biggest disadvantage is flight time.
2. Fixed-wing/aircraft (A) - the advantage of airplanes is the length of flight and the ability to carry considerable weight. The disadvantage is the inability to hover in place, which reduces their manoeuvrability, and requires providing a takeoff and landing site with a runway
3. Single-rotor UAV/helicopters (H) - the main advantage of this design is longer flight time, carrying capacity and the possibility of using internal combustion engines. The biggest disadvantage of helicopters is how complicated they are to control.

Pursuant to *COMMISSION DELEGATED REGULATION (EU) 2019/945 of March 12, 2019*, as of Jan. 1, 2024, unmanned aerial vehicles meet certain conditions, including being equipped with a DRI remote identification system and must be classed from C0 to C6

Unambiguous remote identification (URI) means a system for local dissemination of information about the UAV in operation, including its markings, that allows obtaining this information without physical access to the UAV.
DRI provides for the broadcast of data from the UAV, in such a way that mobile devices that are in the broadcast zone can receive:
- SUAV operator registration number,
- the serial number of the UAV,
- the time, position and altitude of the UAV,
- UAV route and speeds,
- UAV pilot's location or launch point,
- SUAV emergency status indication.

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The requirement for an active and updated unambiguous remote identification system during operations with unmanned aircraft systems applies to UAVs that are designated as Class C1, C2, C3, C5 or C6.

Classification of drones in open category			
Subcategory	Drone Class	Drone mass	Symbol designating drone class, mounted on the chassis
A1	Built by operator	<250 g	N/A
	C0	<250 g	0
	C1	<900 g	1
A2	C2	< 4 kg	2
A3	C3	< 25 kg	3
	C4	> 25 kg	4

1.2 Drone application categories

By application, we divide drones into:

1. Recreational drones - drones that are used for fun and as an entry point for learning how to operate drones, generally, are often very lightweight devices available for beginner pilots.
2. FPV drones - drones that allow flying with a first-person view, the pilot sees in real time what the device's camera sees. Often very lightweight and designed to be as manoeuvrable and fast as possible.
3. Professional drones - drones equipped with advanced stabilisation systems and optics, used for photography, filming and inspections, providing a convenient tool for work in a wide variety of fields
4. Industrial drones are technical solutions, i.e. thermal imaging cameras, cameras with high optical zoom, dedicated to surveillance, inspection, and use in harsh weather conditions, allowing humans to be replaced in dangerous conditions. Giving the ability to plan missions to map or create 3D models, and use lidar imaging.
5. Agricultural drones - drones used for monitoring the condition of crops, assessing the course of vegetation, agro-agricultural treatments, which are part of the

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assumptions of precision agriculture, to reduce the use of chemicals in agricultural production.

6. Rescue and police drones - unmanned aerial vehicles used for search, providing a means of survival for those waiting for rescuers to arrive. Drones are used to monitor fires, floods, and dikes. Devices used to secure events, gatherings, for operational activities.
7. Military drones - drones designed for battlefield reconnaissance, but also devices that carry armaments.

Drone technology is currently used in the following areas:

1. Photography and filming
2. Geodesy
3. Supervision and inspection of equipment
4. Supervision and inspection of structures, including roads
5. Architecture and landscape architecture
6. Agriculture
7. Forestry
8. Supervision and protection
9. Photovoltaics
10. Inventory of areas, aggregate and bulk material dumps
11. Governmental inspections

1.3 The U-space concept

The following definition is a concise description of the idea of developing a field, assuming the provision of services by entities using unmanned aerial vehicles. Attempts are underway to use drones to transport packages, materials or even people:

"U-Space is an interdisciplinary infrastructure concept, backed by an economic aspect, to ensure the safe, fast and efficient development of services using unmanned aerial vehicles implemented with new technologies.

The foundation of the concept is based on a safe, automatic traffic management system for (eventually automatic) unmanned aircraft.

The goal of implementing the concept is to develop an entirely new sector of the economy."

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2. EU Guide to Drone Use

In the following paragraph, we provide information about regulations and definitions that are necessary for any future UAV pilot looking to work in accordance with EU regulations.

2.1 EU legislation on drone use

In the territory of the European Union, the following articles are considered the universal basis for drone-related legislation:
COMMISSION IMPLEMENTING *REGULATION (EU) 2019/947 of May 24, 2019.*
(Consolidated version of April 4, 2022) on regulations and procedures for the operation of unmanned aerial vehicles;
COMMISSION DELEGATED *REGULATION (EU) 2019/945 of March 12, 2019.*
(Consolidated version of August 9, 2020) on unmanned aerial systems and operators of unmanned aerial systems from third countries and their later amendments;

"Easy Access Rules for UAS" - July 2024. - Interpretation of the provisions contained in *Regulations 2019/947 and 2019/945*

Local Civil Aviation Authorities across the European Union, created further specific legislation meant to further regulate UAV operations.

Link to the list of all National Aviation Authorities

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2.2 List of UAV-related definitions

AGL - (Above Ground Level) height above ground level

AIP - (Aeronautical Information Publication) a collection of aeronautical information, containing data on airports, airways and applicable procedures that are relevant to air navigation, developed in accordance with ICAO standards and recommendations

AMSL - (Above Mean Sea Level) height from mean sea level

Safe distance - the distance of the unmanned aircraft from other aircraft, obstacles, bystanders or animals to avoid collision, resulting from an analysis of the prevailing meteorological conditions, the environment and obstacles located in the area of operation, as well as the type of unmanned aircraft used and the qualifications of the pilot;

AUP - (Airspace Use Plan) airspace use plan, a formal document containing information on the activity of structures

Binding - synchronisation of the TX transmitter with the RX receiver so that it recognises only the unique code of the transmitter

UAV - unmanned aircraft, i.e. any aircraft operated or intended to be operated without a pilot on board, which can operate autonomously or be piloted remotely

BVLOS - (Beyond Visual Line of Sight Operation) operations beyond visual line of sight, in which the pilot of an unmanned aircraft does not maintain direct visual contact with the unmanned

EASA - European Aviation Safety Agency. European Union agency based in Cologne, dealing with air traffic safety problems in Europe. The agency began operations in September 2003. The legal basis for the Agency's operation is *Regulation (EC) No 216/2008* of the European Parliament of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council *Directive 91/670/EEC*, *Regulation (EC) No 1592/2002* and *Directive 2004/36/EC*.

Failsafe - a programmable, automatic hover, landing or return to takeoff function initiated when the unmanned aircraft loses signal

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FPV- (First Person View) first-person view operations, in which the pilot directs the unmanned aircraft, does not maintain visual contact with it, determining its position in space through images transmitted in real time to the ground through devices mounted on its deck

Geofence -sets a horizontal boundary (virtual fence) so that the pilot can maintain their operation within a specific geographical area.

Geocage - defines the space in which the flight takes place, by limiting the maximum distance from the transmitter , creating a virtual cage

ICAO - (International Civil Aviation Organization) International Civil Aviation Organization.

INOP - operating instructions

"Open" category - the category of operations performed with the unmanned aircraft system, as defined in Article 4 of *Regulation No. 2019/947/EU*;

"Special" category - the category of operations performed with the unmanned aircraft system, as defined in Article 5 of *Regulation No. 2019/947/EU*;

Kp index - geomagnetic monitoring index on a scale of 0 to 9

MTOM - maximum takeoff mass: the maximum mass of an unmanned aircraft, including payload and fuel, specified by the manufacturer or constructor, at which the unmanned aircraft can be operated

Aircraft envelope - aircraft limits that allow the operation of a UAV, as specified in the manufacturer's or constructor's operating instructions

Observer - a person designated by the pilot, assisting them to observe an unmanned aircraft to ensure a safe distance from other aircraft, obstructions of persons or animals: an observer of an unmanned aircraft within the meaning of Article 2 ,point 24 of *Regulation No. 2019/947/EU*;

UAV operator - any natural or legal person operating or intending to operate at least one unmanned aerial system

Automatic operation - an operation in which the unmanned aircraft automatically performs takeoff and landing at a designated place and flight along a programmed route, when the pilot only performs remote supervision of the operation, retaining the

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ability to immediately take over remote control of the unmanned aircraft or take other actions in case of an unsafe situation

UAV pilot - a natural person responsible for the safe flight performance of an unmanned aircraft, holding the required authorizations, carrying out flight operations by manual control or carrying out automatic flight supervising and monitoring the course of operations, pilot of an unmanned aircraft within the meaning of Article 3(31) of Regulation No. 2018/1139/EU;

SORA (Specific Operation Risk Assessment) - a way of assessing risk for operations in a specific category

STS - (Standard Scenario) - a standard scenario

Special caution - caution involving increased attention, adaptation of the pilot's behaviour, securing the place of takeoff and landing of the unmanned aircraft or the area over which the flight is taking place, to the conditions and situations changing during the execution of the fligh, to the extent that the flight can be performed safely

TOM - (Take-off Mass) The take-off mass of the aircraft

VLOS - (Visual Line of Sight Operation) operations within visual line of sight, in which the pilot of an unmanned aircraft maintains direct visual contact with the unmanned aircraft

Multicopter - a rotorcraft maintained in flight mainly by the reaction of the air to more than two rotors

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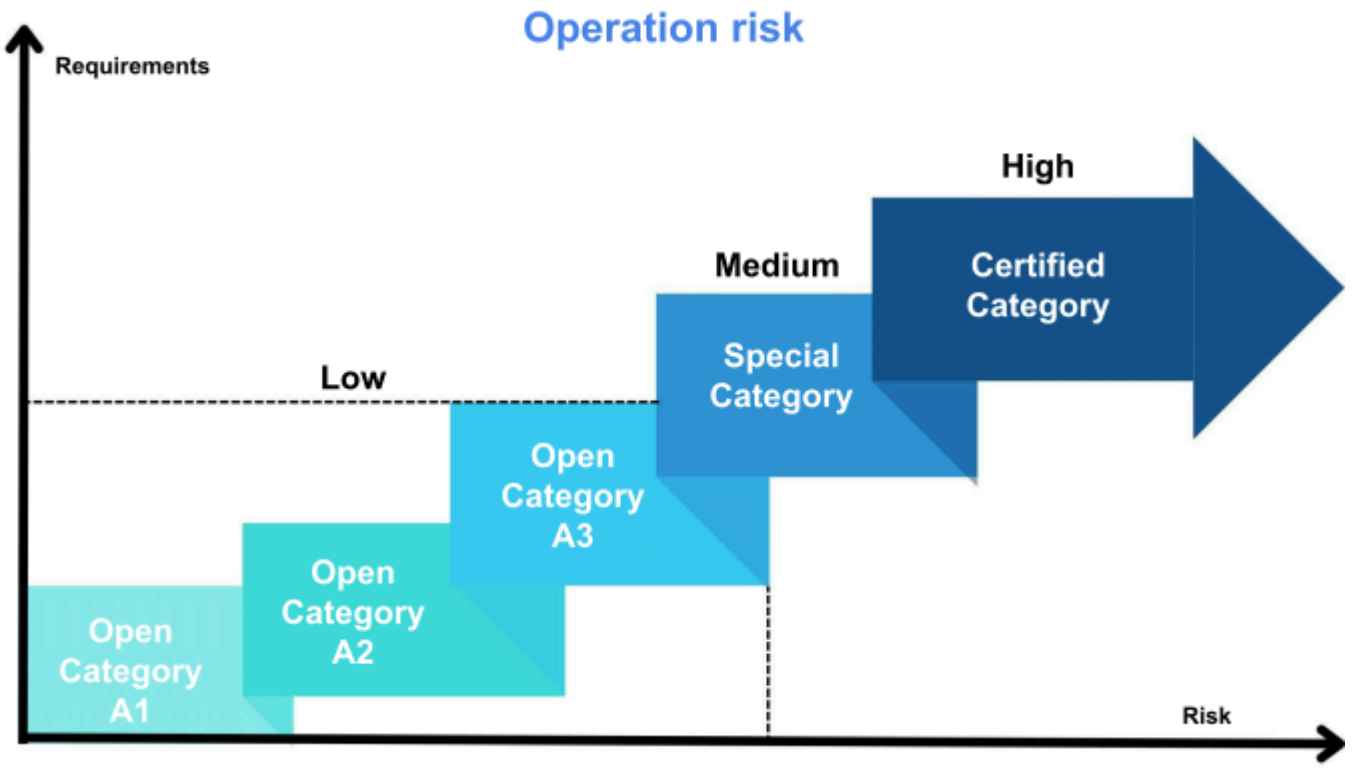
2.2 General conditions for flight operations and drone registration



In regulating the conditions for flight operations, EASA has adopted as a basis for the assessment of the risks associated with planned flight operations..

As the risk of a planned flight increases, so do the demands on pilots and equipment.

When we lack operational capabilities in the open category, we move to the rules of the special category, and similarly, when the rules of the special category are insufficient, we plan operations in accordance with the rules of the certified category.

Simplifying:

- The open category is low-risk flying meaning we can fly a small drone close to people or a large device away from people and urban areas.

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- The special category is medium-risk flying, meaning we fly a larger drone closer to people, but the requirements and strictures on the equipment of pilots and operators are definitely higher.
- The certified category applies to high-risk flights, and we are still waiting for the final regulations. We know that it applies to devices weighing more than 25 kilograms, with a maximum typical dimension of more than 3 meters, drones transporting hazardous cargo and carrying people.

An operator of an unmanned aircraft (UAV) could be compared to an airline that owns a lot of planes, but does not fly them itself. What they do is train pilots who, during courses and training, acquire the required credentials to fly the aircraft in question. It's much the same in the unmanned aviation community.

European drone regulations have made it mandatory to register operators, i.e. individuals or legal entities (e.g. companies, public institutions) that "intend to operate at least one unmanned aircraft system."

Mandatory operator registration is subject to:

- Where the mass of the drone is 250 g or more, or in the case of a drone that can impart kinetic energy of more than 80 joules to a person during impact;
- Where the drone is equipped with a sensor capable of collecting personal data (e.g., a camera), unless the drone in question is considered a toy under *Directive 2009/48/EC*, i.e., it is intended for children under the age of 14.

The pilot's competence required to fly drones depends on the risks associated with what they intend to fly, where they intend to fly. An increase in risk entails an increase in the requirements for the pilot. Thus:

- For the lightest UAVs (<250 g), formally, only a good knowledge of the UAV manual is required.
- For heavier drones (>250 g), it is necessary to complete a free online training course and then pass a free online exam of theoretical knowledge confirming the acquisition of competence to fly in subcategories A1 and A3.
- Acquiring the competency to fly in subcategory A2 allows you to fly class C2 (>4kg) drones requires passing a theoretical exam in 3 subjects in the designated subject: meteorology.
- When performing operations in the "special" category, registration is required for all UAV operators regardless of the weight of the drone being operated. The UAV

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operator must have submitted a Statement of Operation Conformance to NSTS or STS Standard Scenario (operators who are LUC-certified are exempt from this requirement) and have the National Drone Information System e-Registration website confirm receipt and completeness of the Statement of Operation Conformance to NSTS or STS Standard Scenario.

- The pilot performing operations for the operator in the "special" category (in the case of a private individual or sole proprietorship, it will be the same person) must have the appropriate competence (certificate of theoretical knowledge and confirmation of completion of practical training).

2.3 Conditions for operation of the unmanned aircraft system in operations in the "Open" category

Operations in the "open" category using unmanned aircraft systems shall be carried out under the following conditions:

1) In accordance with the provisions of Part A of the Annexe to *Regulation No. 2019/947/EU*;

2) In the case referred to in Article 22(a) of *Regulation No. 2019/947/EU*, the pilot has the competencies referred to in UAS.OPEN.020(4)(b) of Part A of the Annexe to *Regulation No. 2019/947/EU*;

3) Taking into account meteorological conditions, information on air traffic restrictions

4) Operations in the "open" category using a first-person view (FPV) unmanned aircraft system shall be carried out only with an observer of the unmanned aircraft at the pilot's side.

The "open" category was created for low-risk flights.

It was divided into three subcategories: A1, A2, A3.

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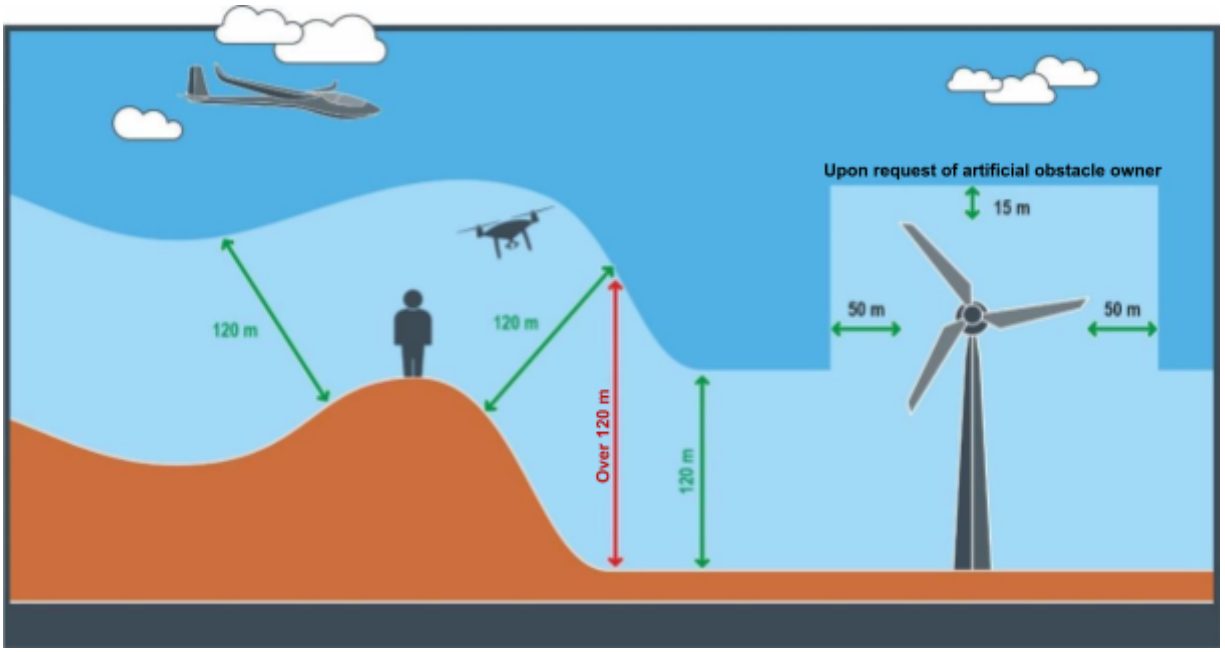
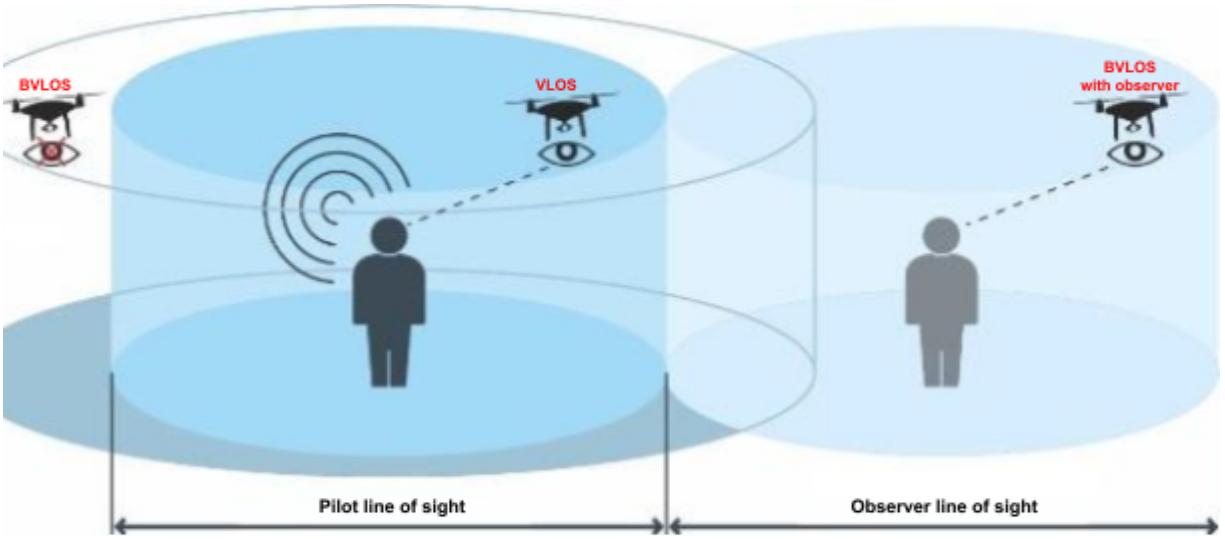
All three are affected by the following restrictions:

1) Flights within 120 m of the nearest point on the ground



2) Flights within visual range



3) Ban on flights over assemblies
4) Drones weighing up to 25 kg

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And for each category following restrictions apply:

Subcategory A1

- Drones marked with class C0 - drone flights up to 250 g - can fly over people
- Drones marked with class C1 - flying drones with a weight of 900 g - must maintain a safe distance from people, allowed to fly over a bystander

Subcategory A2

- Drones marked with class C2
- Drones weighing up to 4 kg
- Flights at a horizontal distance of at least 30 m from any human being
- Flights at a distance of at least 5 m when using slow flight mode (3m/s)

Subcategory A3

- Drones marked with class C3 - C4
- Drones weighing up to 25 kg
- Drones not marked by class
- Drone flights at a horizontal distance of at least 150 m from residential, industrial, recreational and sports areas

2.4 Conditions for operation of the unmanned aircraft system in operations in the "Special" category

Operations in the "special" category using an unmanned aircraft system shall be carried out under the conditions specified in Part B or Part C of the Annexe to *Regulation No. 2019/947/EU*:

in accordance with the standard scenarios published in Appendix 1 of the Annexe to *Regulation No 2019/947/EU*; or

in accordance with the national standard scenarios announced by the President of the Authority in the Official Journal of the Civil Aviation Authority; or

after obtaining an authorisation for the operation referred to in Article 5(1) of *Regulation 2019/947/EU*, and under the conditions specified therein; or

upon obtaining LUC certification in accordance with Part C of the Annex to *Regulation 2019/947/EU*, subject to Section 6.1.

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Once more, future drone pilots need to remember, the Civil Aviation Authority in each country is responsible for regulating flights within the "special" category, and consulting local guidelines is required.

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3. Safety

In the following paragraph, we offer a basic, concise list of checks and practices UAV pilots should be used to and rely upon for regular operations.

3.1 Safety list and practices

Every future pilot should remember that 88% of aviation accidents are caused by human error and can be prevented with careful preparation.

Aviation safety is based on risk assessment and procedures to eliminate or reduce the possibility of an error resulting in an aviation accident or incident.

The following is a sample list of control activities:

1. Equipment preparation
2. Check airspace availability
3. Check the weather forecast
4. Check KP index
5. Check in
6. Verifying drone Return-To-Home procedures
7. Drone take-off and performance verification
8. Task execution
9. Equipment check after landing

Repetition of these procedures as a habit develops and builds skills and improves safety, following a well-prepared list will ensure minimal risk of accidents.

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4. Privacy

In the following paragraph, we would like to raise awareness about privacy issues regarding UAV flight, due to drones' reliance on specialised recording equipment.

4.1 EU privacy regulations

The entry into force of *Regulation (EU) 2016/679* of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data and repealing *Directive 95/46/EC* (General Data Protection Regulation), has become the basis for privacy legislation.

The popular RODO obliges operators to obtain consents for the publication of images and the possibility of collecting information about individuals. It should be borne in mind that individual EU member states may regulate the aforementioned regulation and create individual, detailed solutions to be adhered to.

When flying drones, we must take into account the regulations and legal restrictions contained in regulations other than aviation law and remain mindful of the specifics of our planned operation.

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5. Useful links

UAS Poland

1. Polish Civil Aviation Authority Drones Section - resources concerning laws and regulations about drone usage and registration
   https://ulc.gov.pl/drony
2. Digital Services for UAVs - a site run by Polish Civil Aviation Authority where drone pilots can register their aircraft, register as operator and take an exam
   https://drony.gov.pl/
3. Polish Air Navigation Services Agency - resources meant for pilots and UAV operators
   https://www.pansa.pl/
4. Dronemap - Polish Air Navigation Services Agency project, showing all categories of flight zones in the country
   https://dronemap.pansa.pl/
5. Drone Tower - Polish Air Navigation Services Agency application, meant for checking in flights of UAVs
   https://drony.gov.pl/drone-tower

UAS Greece

1. Hellenic Civil Aviation Authority (HCAA) - Section of General Aviation & Drones
   https://hcaa.gov.gr/en/geniki-aeroporia-smiea
2. DAGR (Drone Aware Greece) System - before conducting any drone flight in Greece, it is mandatory to check airspace restrictions through this platform
   https://dagr.hasp.gov.gr/#map_page
3. Regulation - General framework for flights of Unmanned Aircraft Systems (UAS)
   https://dagr.hasp.gov.gr/docs/HCAA%20UAS%20Regulation.pdf
4. Easy Access Rules for Unmanned Aircraft systems (Regulation (EU) 2019/947 and Regulation (EU) 2019945) (Online format)
   https://www.easa.europa.eu/en/document-library/easy-access-rules/online-publications/easy-access-rules-unmanned-aircraft-systems

UAS Germany

1. Digital Platform for Unmanned Aviation – "Geographical zones" (dipul)
   https://dipul.de/homepage/en/information/geographical-zones/

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2. Drone flight rules and approvals – DFS (Deutsche Flugsicherung): https://www.dfs.de/homepage/en/drone-flight/applications-and-approvals/
3. National Civil Aviation Authority of Germany – Responsible for licensing, certification, regulation, and enforcement in civil aviation, including drones: https://www.lba.de/EN/Drones/Cross_Border_Operations/Cross_Border_Operations_node.html
4. Germany – Unmanned Aircraft Systems – Drones: https://www.lba.de/EN/Operations/UnmannedAircraftSystems/UnmannedAircraftSystems_node.html

5. Integrating new airspace users

   https://www.dfs.de/homepage/en/drone-flight/

6. Registration and qualification (Registration as a drone pilot) https://www.uas-operations.de/homepage/en/information/general/registration-and-qualification/

UAS Spain

1. Drones regulations https://www.seguridadaerea.gob.es/en/ambitos/drones/normativa-de-uas-drones
2. Geographical areas of UAS https://www.seguridadaerea.gob.es/en/ambitos/drones/zonas-geograficas-de-uas
3. Training of UAS/drone pilots in "specific" category in National Standard Scenarios (STS-ES) https://www.seguridadaerea.gob.es/en/ambitos/drones/formacion-de-pilotos-a-distancia-uas-drones/formacion-de-pilotos-uas-drones-en-categoria-respecificar
4. How to fly a UAS in Spain https://www.seguridadaerea.gob.es/en/ambitos/drones/how-to-fly-a-uas-in-spain
5. UAS/Drones operator registration for non-EASA activities https://www.seguridadaerea.gob.es/en/ambitos/drones/actividades-o-servicios-no-easa-con-uas/registro-de-operador-de-uas-drones-para-actividades-no-easa

UAS Italy

1. **ENAC – Drone Operator Registration**
   Official page about the obligation to register as an operator in Italy.
   https://www.enac.gov.it/sicurezza-aerea/droni/categoria-specifica-specific-category/

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registrazione-degli-operatori/?

2. **ENAC – How to Become a UAS (Drone) Pilot – OPEN A1/A3**
   Explains how to take the online exam, requirements, and certification for category OPEN A1/A3.
   https://www.enac.gov.it/sicurezza-aerea/droni/piloti-uas/come-si-diventa-pilota-uas-drone-open-a1a3/?

3. **D-Flight – Registration and Account Management**
   The official Italian portal (certified by ENAC) for operator registration, drone registration, and services.

   https://www.d-flight.it/new_portal/services/registrazione-e-gestione-account/?

4. **ENAC – Drone Operators (UAS)**
   Overview of operator obligations, use of D-Flight, QR codes, and Italian regulatory framework.
   https://www.enac.gov.it/sicurezza-aerea/droni/operatori-di-droni-uas/?

5. **ENAV – Drone Services**
   Information on ENAV's role in drone services and integration with U-Space in Italy.
   https://www.enav.it/cosa-facciamo/servizi-drone

UAS Cyprus

1. Department of Civil Aviation Unmanned Aircraft Cyprus CYPRUS – UAS Cyprus. (2021). Drones.gov.cy. https://drones.gov.cy/
2. Exam Centres – Department of Civil Aviation Unmanned Aircraft Cyprus CYPRUS. (2024). Drones.gov.cy. https://drones.gov.cy/approved-exam-centers/
3. Drone Laws in Cyprus | UAV Coach (2023). (2025, May 9). UAV Coach. https://uavcoach.com/drone-laws-in-cyprus/
4. Team, E. (2021, June 23). Cyprus Drone Laws. Drone Laws. https://drone-laws.com/drone-laws-in-cyprus/
5. Operational Authorisation – Department of Civil Aviation Unmanned Aircraft Cyprus CYPRUS. (2019). Drones.gov.cy. https://drones.gov.cy/operational-authorisation/

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REFERENCES

1. European Union site containing a database of all laws and regulations, including those related to UAV operations
https://eur-lex.europa.eu/

2. European Union Aviation Safety Agency site dedicated to Civil drone operations - https://www.easa.europa.eu/en/domains/civil-drones

3. European Union Aviation Safety Agency site with information about registering a drone and as an operator, alongside a list of all National Aviation Agencies of member states - https://www.easa.europa.eu/en/domains/civil-drones/naa

4. European Commission site designating and codifying occupations, including those requiring drones- https://esco.ec.europa.eu/en/classification/occupation_main

5. Drone 360 project site, including information about the project, drone-related jobs potential and compilation of useful interviews and podcasts - https://drones360.eu/

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