UAS Categories

UAS do _not_ fall under EASA UAS regulations

UAS fallen unter die EASA UAS-Regeln

Interior

military, police, fire brigade, border guards, customs, coast guards, …

OPEN

Meet _all_ criteria

- < 25 kg
- Not overhead assemblies of people
- < 120 m AGL
- VLOS
- No dangerous goods

SPECIFIC

Meet at least _one_ criterion:

- > 25 kg
- > 120 m AGL or special airspace
- BVLOS

CERTIFIED

Meet at least _one_ criterion:

- Over assemblies of people
- Transport of dangerous goods
- Transport of people

Open Categories

Flight may be operated, if...	Sub-category	UAS class	Area of operation	Qualification
...the UAS meets the technical requirements.	**A1** Near persons	C0 < 250 g	Overflight of uninvolved persons	No
...the remote pilot complies with the operating rules.		C1 < 900 g	No overflight of uninvolved persons	Online training & Online test
...the remote pilot is adequately qualified.	**A2** Safe distance from people	C2 < 4 kg	30 m / 5 m safety distance to uninvolved persons	Online training & Online test Practical self-training Theory test on site
...the operator is registered (if necessary).	**A3** Far away from people	C3 < 25 kg C4 < 25 kg	No endangerment of uninvolved people – 150 m safety distance	Online training & Online test

Technical Classes

CE

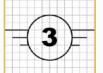|			
C0 <250 g	0	Areas in which it cannot be ruled out that **uninvolved persons** will be overflown.	**A1** Near persons
C1 <900 g	1	Areas where the remote pilot can assume that **no uninvolved persons** will be overflown.	
C2 <4 kg	2	Areas where **a horizontal minimum distance of 30 m / 5 m** from uninvolved persons can always be maintained.	**A2** Safe distance from people
C3 <25 kg	3	Areas in which **no uninvolved persons are endangered** and at a distance of **at least 150 m** from residential areas, industrial plants, leisure facilities, etc.	**A3** Far away from people
C4 <25 kg	4		
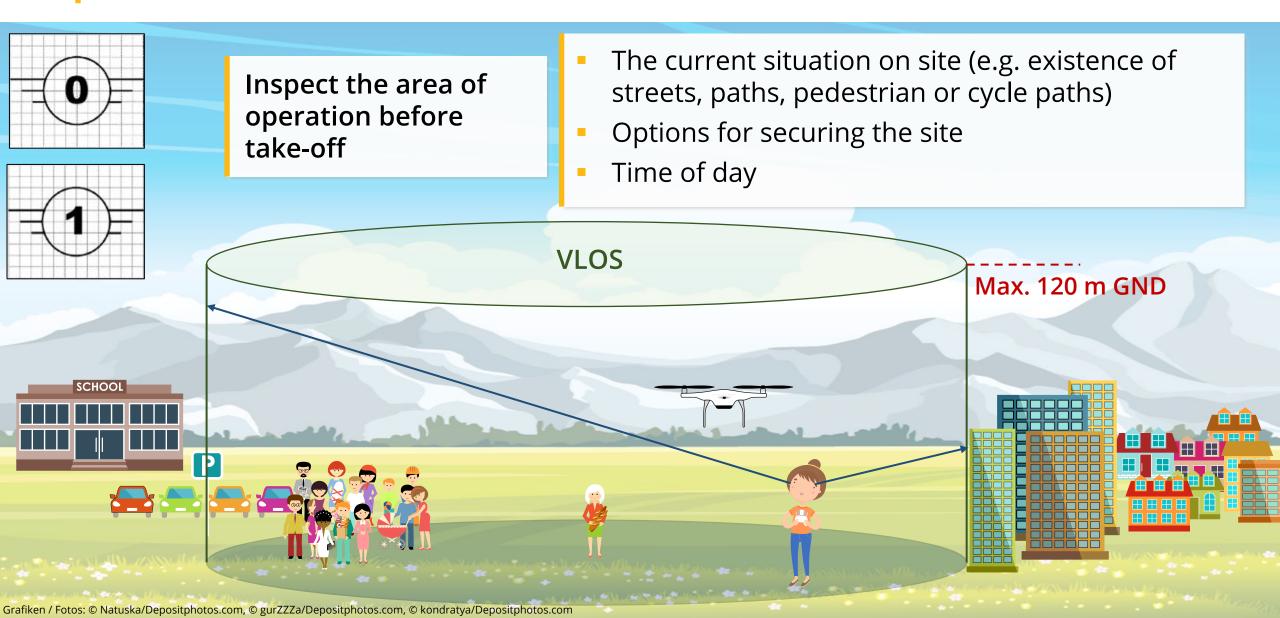
Technical Classes

	0	1	2	3	4
Max. take-off mass	< 250 g	< 900 g	< 4 kg	< 25 kg	< 25 kg
Max. speed	19 m/s	19 m/s	-	-	-
Max. altitude	120 m	120 m / Setting	120 m / Setting	120 m / Setting	-
Altimeter	no	yes	yes	yes	no
Remote identification	no	yes	yes	yes	no
Geo-awareness	no	yes	yes	yes	no

Open Category A1

Inspect the area of operation before take-off

- The current situation on site (e.g. existence of streets, paths, pedestrian or cycle paths)
- Options for securing the site
- Time of day

VLOS

Max. 120 m GND
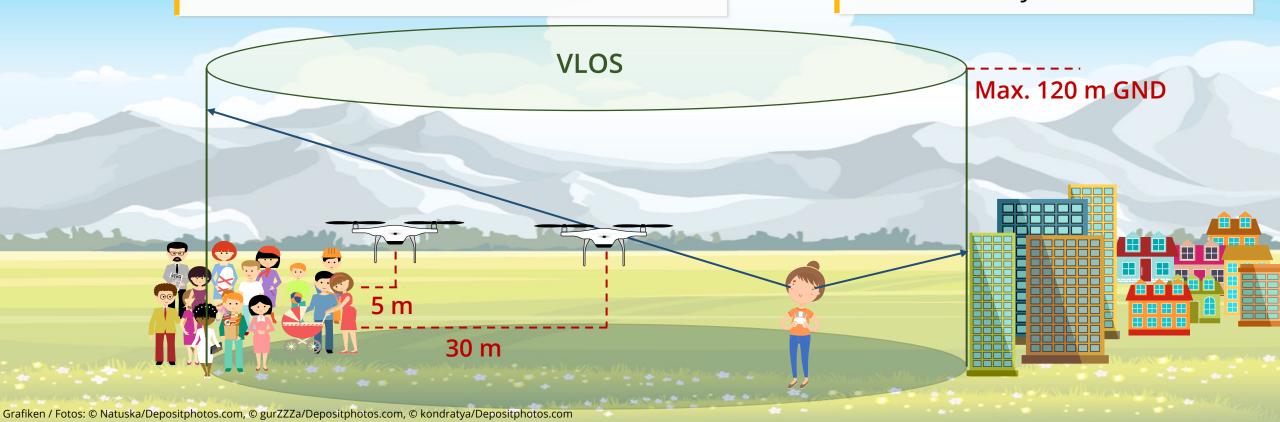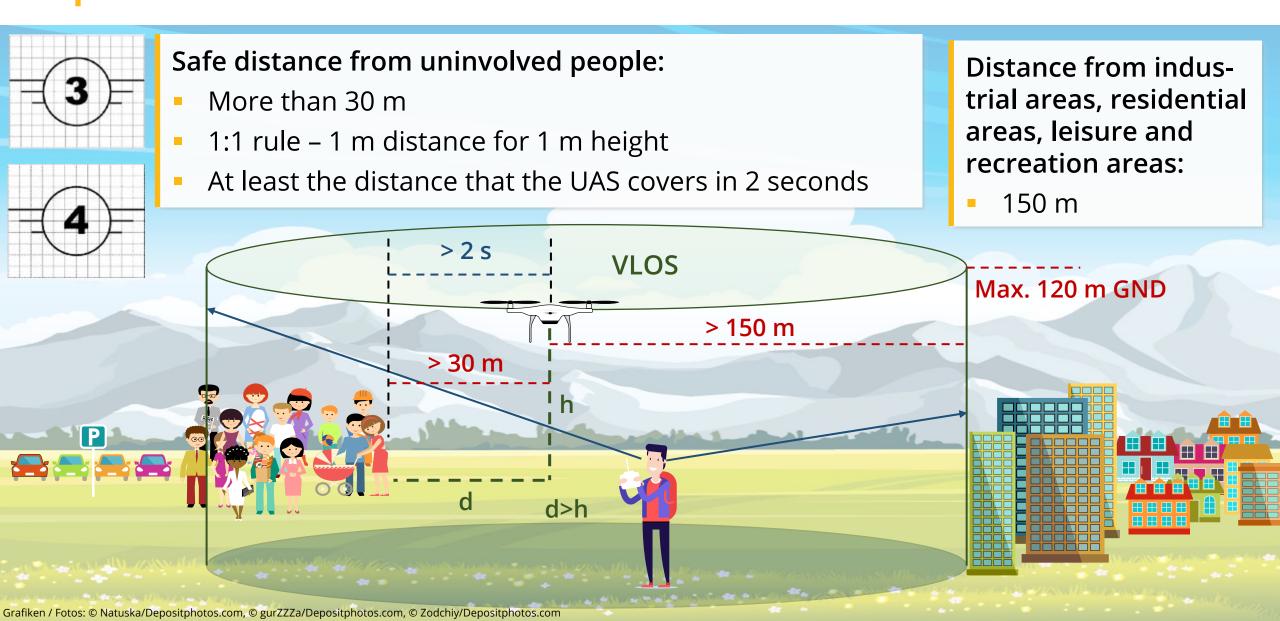
SCHOOL

Open Category A2

Safety distance:
- 5 m during slow flight operation (3 m/s) or for UAS balloons and airships
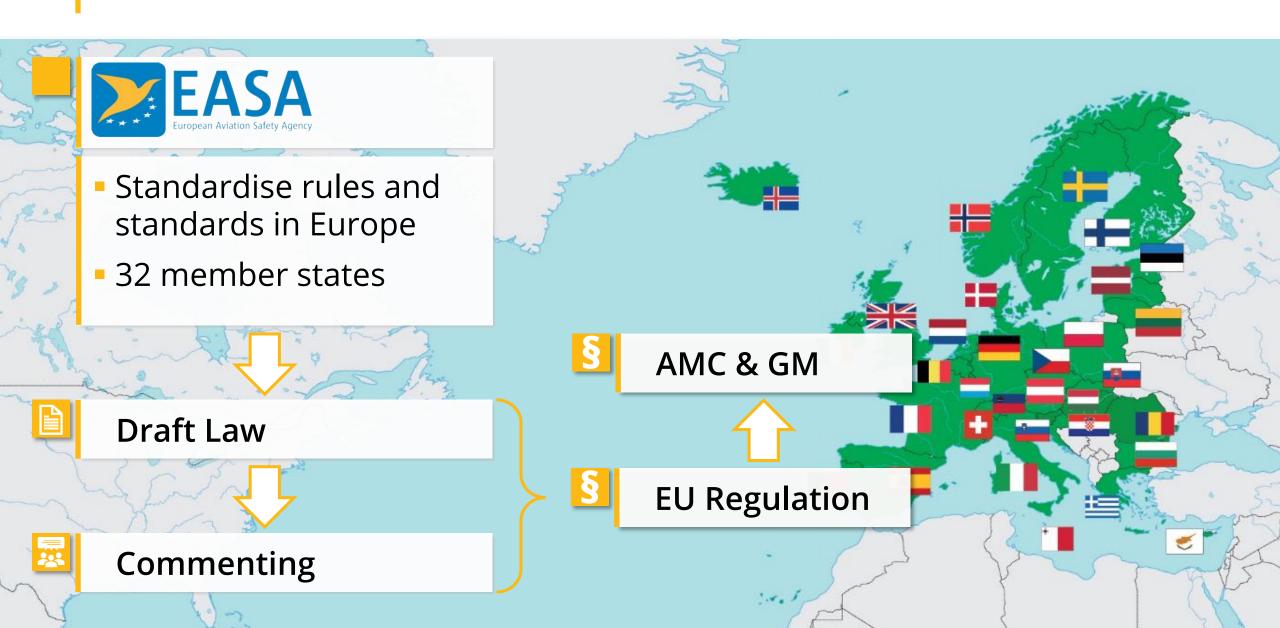- 30 m in other situations

Greater safety distance for example:
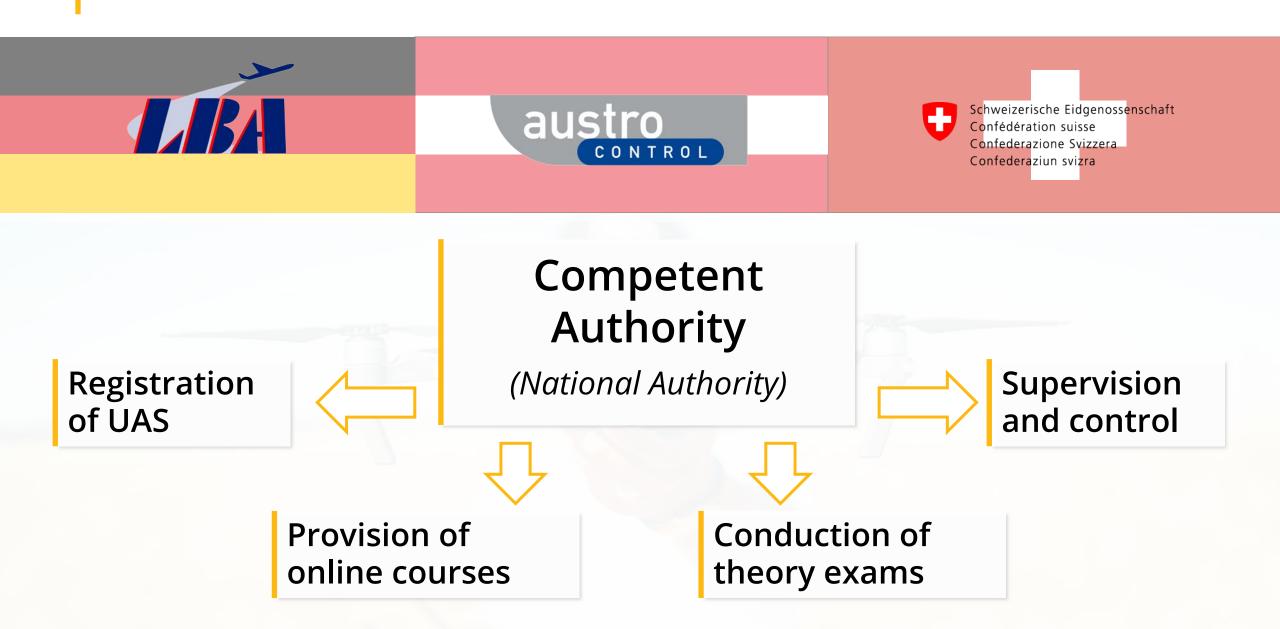- Strong winds
- Low battery level

VLOS

Max. 120 m GND

5 m

30 m

Open Category A3

Safe distance from uninvolved people:
- More than 30 m
- 1:1 rule – 1 m distance for 1 m height
- At least the distance that the UAS covers in 2 seconds

Distance from industrial areas, residential areas, leisure and recreation areas:
- 150 m

> 2 s

VLOS

Max. 120 m GND

> 150 m

> 30 m

h

d

d>h

EASA

EASA
European Aviation Safety Agency

- Standardise rules and standards in Europe
- 32 member states

Draft Law

Commenting

AMC & GM

EU Regulation

National Administration

Competent Authority

(National Authority)

Registration of UAS

Supervision and control

Provision of online courses

Conduction of theory exams

Legal Basis

**(EU) 2018/1139
'Basic Regulation'**

*Essential requirements
for European aviation*

**(EU) 2019/945
'Delegated
Regulation on UAS'**

*Technical
specifications*

**(EU) 2019/947
'UAS Implementing
Regulation'**

Rules and procedures
of operation

**National
Regulations**

Airspace

*Geographical
zones*

AMC & GM

AMC & GM

AMC & GM

National Regulations Austria

https://www.dronespace.at/

Qualification: Minimum Age

No minimum age

- C0 UAS operated in sub-category A1
- Toy compliant to 2009/48/EC
- Supervision by qualified remote pilot

Minimum age when operating UAS in the OPEN category

- 16 years
- Can be reduced by maximum 4 years
  - Different regulations may apply within the EU!

Qualification: Knowledge

Online training & test

- A1-A3
  - *Exception: C0*
- Areas (40 MCQ):
  - *Air safety*
  - *Airspace restrictions*
  - *Aviation regulations*
  - *Human performance*
  - *Operational procedures*
  - *UAS general knowledge*
  - *Privacy and data protection*
  - *Insurance*
  - *Security*
- Valid for 5 years

Self-practical training

- Only A2 (UAS-class C2)
- Independently in open spaces
  - *No endangerment of uninvolved people*
  - *distance of at least 150 m from residential, industrial, leisure or recreational areas*
- Conduction of training
  - *Min. 5 flights*
  - *Operating areas / limits*
  - *Controls and modes*
  - *Abnormal procedures*
- Self-declaration

On-site theory test

- Only A2 (UAS-class C2)
- Areas (30 MCQ):
  - *Meteorology*
  - *UAS flight performance*
  - *Technical and operational mitigations for ground risk*
- After passing: certificate of competency

Registration of the UAS

Obligatory registration

- Max. take-off mass > 250 g
- Impact energy > 80 J
- Sensor that enables recording of personal data
  - *video or infrared cameras,*
  - *photo cameras or*
  - *microphones*

ℹ Impact energy

- Kinetic energy
- Loss of control with 19 m/s at 25 m

→ *Acceleration during loss of altitude*

→ *Impact energy up to 110 J possible*

→ *Injuries and damages*

❗ Registration by the competent authority (main residence or place of business of the operator)

Airspace / Aeronautical Charts

https://rogersdata.at/

https://maps.austrocontrol.at/mapstore/

Relevant airspaces near the ground

- Control zones

- Danger, restricted and prohibited areas

- Nature reserves

- Military low-altitude areas

Geographical UAS Zones

Definition and Publication of Geographical Zones

Operation of UAS prohibited

Prior approval

Additional requirements
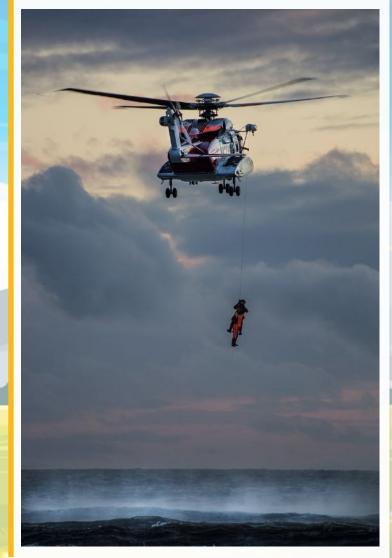
No information

Simplified requirements

Restrictive

General Rules (OPEN category)

Open

Operation Near the Ground

No overfly of assemblies of people!

Responsibilities

UAS Operator
Operates the UAS

Remote Pilot
Flies the UAS

Duties before the operation

- Valid certificate?
- Up-to-date information on geographical zones
- Check surroundings
- Operational state
  - Controls
  - Remote identification
- MTOM not exceeded

Duties during the flight

- Ensure VLOS
- Monitor airspace
- End flight in case of risk
- Observe geographical zones
- Consider operating manual
- Consider specifications of the UAS operator

‚Good Airmanship'

The (remote) pilot is...

"familiar with the principles of aerodynamics,

has the ability to control the aircraft competently and precisely, both on the ground and in the air, and

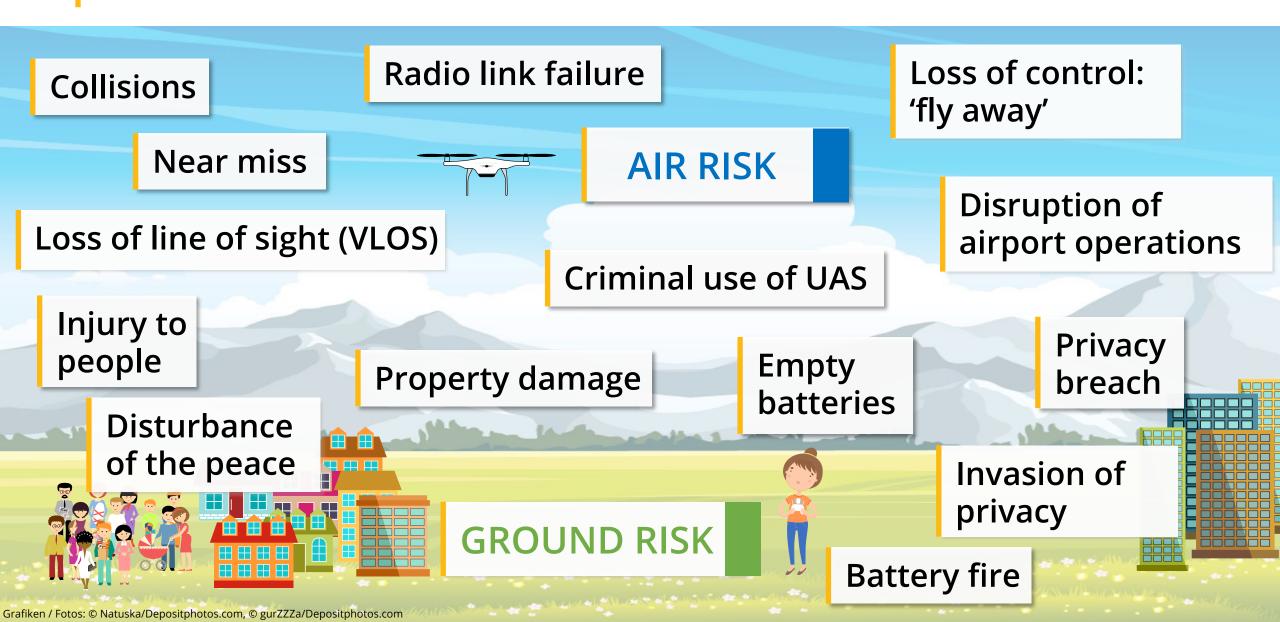*has good judgment that ensures safe and efficient operation. "*

Recognise and minimise risks

Decision Making

Principles

- No reckless behaviour
- No risk
- In case of even slight doubt of own capabilities: practise in safe environment
- Check weather conditions and maybe postpone flight
- Observe and assess the environment constantly

Risks

Collisions

Radio link failure

Loss of control: 'fly away'

Near miss

AIR RISK

Loss of line of sight (VLOS)

Disruption of airport operations

Criminal use of UAS

Injury to people

Property damage

Empty batteries

Privacy breach

Disturbance of the peace

GROUND RISK

Invasion of privacy

Battery fire

Rules of the air

Rules of Priority

- Manned aircraft always have priority

- Never fly recklessly or close to other aircraft because of collision risk

- Give way to aircraft with problems

- Landing aircraft have priority over aircraft taking off

Maximum Altitudes

Visual Line of Sight (VLOS)

BVLOS
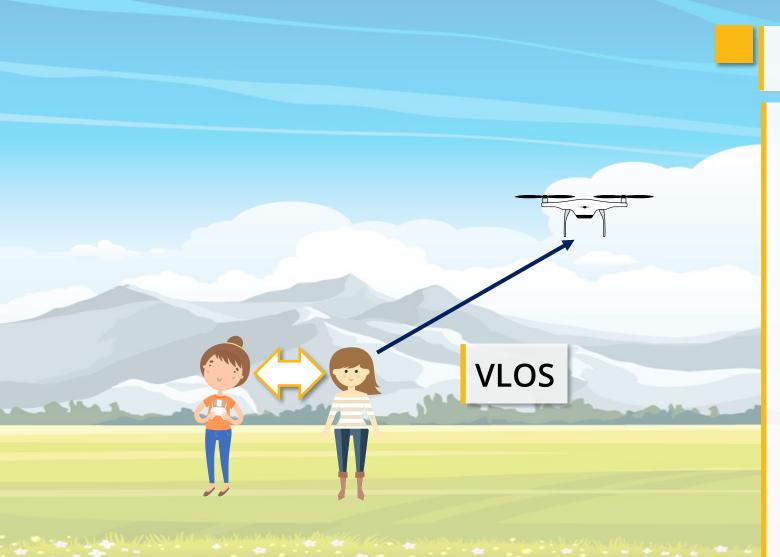*Beyond Visual Line of Sight*

VLOS
Visual Line of Sight

VLOS

BVLOS

„Follow-Me" Mode

- Classes C0 and C1
- UAS follows automatically
- Max. 50 m distance

"First Person View" (FPV)

VLOS

BVLOS / FPV

- Second qualified person acts as observer
- Monitors airspace and environment
- Observer is directly next to remote pilot
- Direct and effective communication
- Remote pilot remains responsible

Dangerous goods
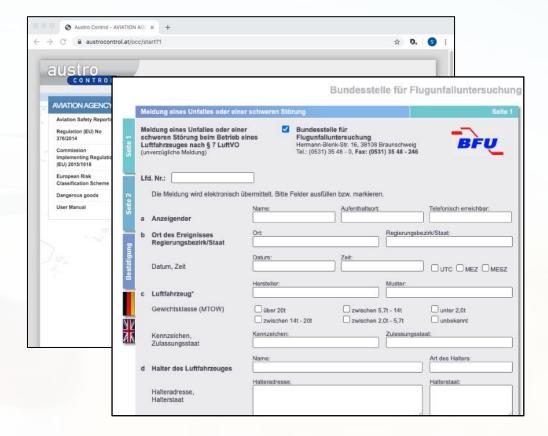
Transport of dangerous goods is prohibited!

All objects or substances which could pose a risk to health, safety, property or the environment:

- Explosive substances

- Gases

- Flammable liquids and solids

- Inflammatory (oxidising) substances and organic peroxides

- Toxic and infectious substances

- Radioactive and corrosive substances

Incident Reporting

Goal: Avoid future accidents

- Someone was seriously injured by a UAS

- Someone was killed by a UAS

- There was a near-collision or incident with a manned aircraft

Reports

Security vs Safety

Security

Protection against **deliberate** interferences

- Terrorism
- Intentional offences
- Misuse of UAS for criminal purposes

Safety

Protection against **accidental** and **unwanted** sources of danger

- Engine failure
- Loss of orientation
- Control failure
- Failure of energy source

Security and Safety

Questions before every flight

- Am I flying for a **legal, permissible reason**?
- Will I **endanger** anyone?
- Is it impossible to **invade the privacy** of others?
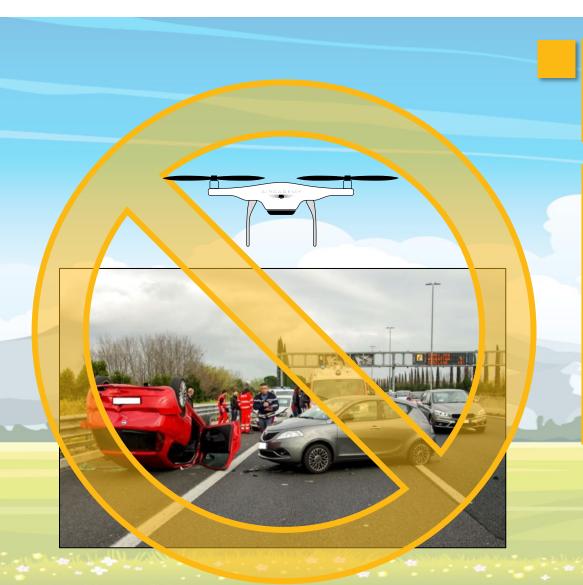- Is it impossible to interfere with the work of **authorities, police or rescue services**?

Crimes

Judged according to national criminal laws

Security and Safety

Active participation in public safety and awareness

- **Actively inform** people that you are flying and why
- Notify other remote pilots about **rule violati**ons
- **Report any misuse** of UAS to the competent authorities

Data Protection

Sensors that can record personal data

 Register

§ GDPR §

- Video cameras
- Photo cameras
- Microphones
- Infrared cameras
- Thermal imaging cameras

Personal Data

Personal data

- Relates to an identifiable natural person
- Name, identification number, location data, online identifier or special features
- Expression of a physical, psychological, genetic, economic, cultural or social identity

Basic principles of use

- **Transparency:** inform data subjects
- **'Data saving':** no personal data whenever possible

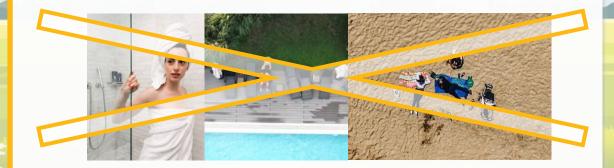**Video, audio and image recordings that show people are covered by data protection laws.**

Personal Data

Processing permitted	Processing prohibited
- Person concerned has agreed	- Trespass into privacy
- To fulfil a contract with the data subject	- Face recognition or other automated processes
- To comply with a legal regulation	- References to specially protected personal data
- To protect vital interests	- Withdrawn consent
- For a public task	
- To safeguard the legitimate interests of the processor or a third party	

Insurance

Question of liability

Who caused the accident?

Who pays for the damage caused?

Remote pilot Operator

Indemnity Insurance
- Damage of third parties (people and things)
- Damage to other aircraft (also manned)
- Damage to yourself not covered
- Important: clarify with insurance company!
  - Additional insurance may be necessary

National regulations

Austria and Germany

MTOM < 500 kg	**MTOM < 500 kg**
Indemnity insurance of minimum 750,000 SDR	Indemnity insurance of minimum 750,000 SDR
SDR: ‚Special Drawing Right'	**Proof of existing insurance**