

# Specifik kategori

PDRA G-01 & PDRA G-02

# [www.easa.europa.eu](http://www.easa.europa.eu) – Easy access rules

The screenshot displays the EASA website's 'Easy Access Rules for Unmanned Aircraft Systems' page. The browser address bar shows the URL: <https://www.easa.europa.eu/document-library/easy-access-rules/easy-access-rules-unmanned-aircraft-systems-regulation-eu>. The navigation bar includes links for Home, The Agency, Newsroom & Events, Domains, Regulations, Document Library, and Can We Help You?, along with a search bar, Login, and Register buttons.

The main content area features the title 'Easy Access Rules for Unmanned Aircraft Systems (Regulation (EU) 2019/947 and Regulation (EU) 2019/945)' and a sub-header 'Revision from September 2021 - Available in online format'. A date stamp indicates '30 Sep 2021' and a 'POPULAR' tag is present. A notification box prompts the user to 'Login or register to stay informed'.

The 'Document Library' sidebar on the left lists various categories: Application Forms, Approval Data Library, Regulations, Agency Decisions, Rulemaking Process, Public Consultations, Product Certification, and International Cooperation. Under 'Publications', it includes Overview, European Plan for Aviation Safety, Annual Activity Report, Safety Reports (with sub-items: Annual Safety Review, Annual Safety Recommendations), Safety Promotion (with sub-items: Aviation Medicine, Commercial Air), and a 'Publications' button.

The main text describes the publication: 'This publication contains the rules and procedures for the operation of unmanned aircraft, displayed in a consolidated, easy-to-read format, with advanced navigation features through links and bookmarks. It covers [Commission Implementing Regulation \(EU\) 2019/947](#), and the related acceptable means of compliance (AMC) and guidance material (GM), as well as [Commission Delegated Regulation \(EU\) 2019/945](#) on unmanned aircraft systems (UAS) and on third-country operators of UAS. This Revision from September 2021 incorporates the changes introduced by [Commission Implementing Regulation \(EU\)](#)'.

An image of the document cover is shown, featuring the EASA logo and a drone icon with the text 'Drones'.

# Vart i regelverket befinner vi oss?

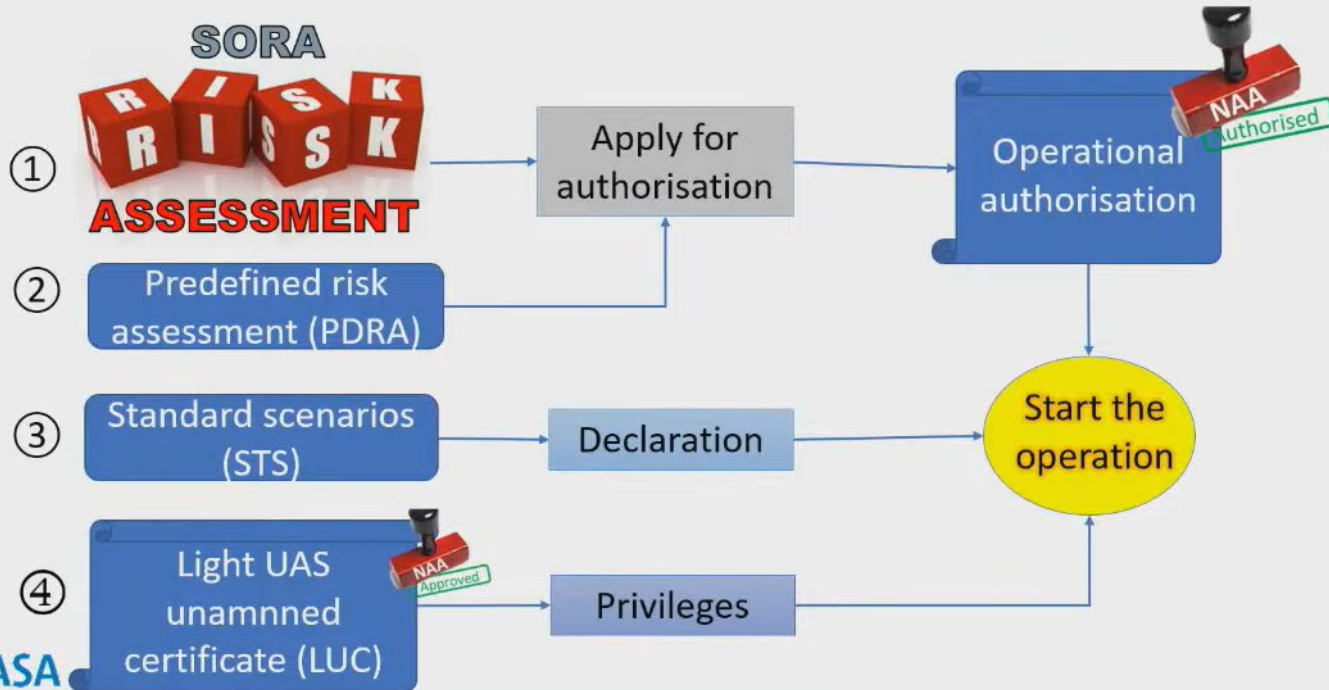
- Öppen kategori
  - A1,A2,A3
  - Drönarkort
- Specifik kategori
  - (STS), PDRA, SORA, (LUC)
  - Operativ auktorisation

## Article 5 - 'Specific' category of UAS operations

Regulation (EU) 2020/639

1. Where one of the requirements laid down in [Article 4](#) or in Part A of the Annex is not met, a UAS operator shall be required to obtain an operational authorisation pursuant to [Article 12](#) from the competent authority in the Member State where it is registered.
2. When applying to a competent authority for an operational authorisation pursuant [Article 12](#), the operator shall perform a risk assessment in accordance with [Article 11](#) and submit it together with the application, including adequate mitigating measures.

# The 'specific' category



# SORA

## SORA methodology- 10 Steps



# GM1 to AMC1 Article 11

## GM1 to AMC1 Article 11 Rules for conducting an operational risk assessment

ED Decision 2020/022/R

### GENERAL

The operational risk assessment required by Article 11 of the UAS Regulation may be conducted using the methodology described in AMC1 Article 11. This methodology is basically the specific operations risk assessment (SORA) developed by JARUS. Other methodologies might be used by the UAS operator as alternative means of compliance.

Aspects other than safety, such as security, privacy, environmental protection, the use of the radio frequency (RF) spectrum, etc., should be assessed in accordance with the applicable requirements established by the Member State in which the operation is intended to take place, or by other EU regulations.

For some UAS operations that are classified as being in the 'specific' category, alternatives to carrying out a full risk assessment are offered to UAS operators:

- (a) for UAS operations with lower intrinsic risks, a declaration may be submitted when the operations comply with the standard scenarios (STs) listed in Appendix 1 to the UAS Regulation. Table 1 provides a summary of the STs; and
- (b) for other UAS operations, a request for authorisation may be submitted based on the mitigations and provisions described in the predefined risk assessment (PDRA) when the UAS operation meets the operational characterisation described in AMC2 et seq. Article 11 to the UAS Regulation. Table 2 below provides a summary of the PDRAs that have been published so far.

# PDRA S-01 & S-02

PDRA#	Edition/date	UAS characteristics	BVLOS/VLOS	Overflown area	Maximum range from remote pilot	Maximum height	Airspace	AMC# to Article 11	Notes
PDRA-S01	1.0/July 2020	Maximum characteristic dimension of up to 3 m and MTOM of up to 25 kg	VLOS	Controlled ground area that might be located in a populated area	VLOS	120 m	Controlled or uncontrolled, with low risk of encounter with manned aircraft	AMC4	
PDRA-S02	1.0/July 2020	Maximum characteristic dimension of up to 3 m and MTOM of up to 25 kg	BVLOS	Controlled ground area that is entirely located in a sparsely populated area	2 km with an AO 1 km, if no AO	120 m	Controlled or uncontrolled, with low risk of encounter with manned aircraft	AMC5	



# PDRA G-01 & G-02

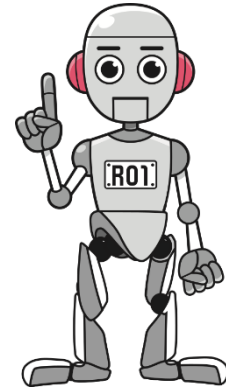
PDRA#	Edition/date	UAS characteristics	BVLOS/VLOS	Overflowed area	Maximum range from remote pilot	Maximum height	Airspace	AMC# to Article 11	Notes
PDRA-G01	1.1/July 2020	Maximum characteristic dimension of up to 3 m and typical kinetic energy of up to 34 kJ	BVLOS	Sparsely populated area	If no AO, up to 1 km	150 m (operational volume)	Uncontrolled, with low risk of encounter with manned aircraft	AMC2	
PDRA-G02	1.0/July 2020	Maximum characteristic dimension of up to 3 m and typical kinetic energy of up to 34 kJ	BVLOS	Sparsely populated area	N/a	As established for the reserved airspace	As reserved for the operation	AMC3	

# PDRA characterisation and provisions

PDRA characterisation and provisions	
1. Operational characterisation (scope and limitations)	
Level of human intervention	<p>1.1 No autonomous operations: the remote pilot should have the ability to maintain control of the UA, except in case of loss of the command and control (C2) link.</p> <p>1.2 The remote pilot should operate only one UA at a time.</p> <p>1.3 The remote pilot should not operate from a moving vehicle.</p> <p>1.4 The remote pilot should not hand over the control of the UA to another command unit.</p>
UA range limit	<p>1.5 <u>Launch/recovery</u>: at VLOS distance from the remote pilot, if not operating from a safe prepared area. <i>Note: 'safe prepared area' means a controlled ground area that is suitable for the safe launch/recovery of the UA.</i></p> <p>1.6 <u>In flight</u>:</p> <p>1.6.1 <u>If no AOs are employed</u>: the UA is not operated further than 1 km (or other distance defined by the competent authority) from the remote pilot. <i>Note: The remote pilot's workload should allow the remote pilot to continuously scan the airspace.</i></p> <p>1.6.2 <u>If AOs are employed</u>: the range is not limited as long as the UA is not operated further than 1 km (unless a different distance is defined by the competent authority) from the AO who is nearest to the UA.</p>
Areas overflow	1.7 UAS operations should be conducted over sparsely populated areas.
UA limitations	<p>1.8 Maximum characteristic dimension (e.g. wingspan, rotor diameter/area or maximum distance between rotors in case of a multirotor): 3 m</p> <p>1.9 Typical kinetic energy (as defined in paragraph 2.3.1(k) of <a href="#">AMC1 Article 11</a> of the UAS Regulation: up to 34 kJ</p>

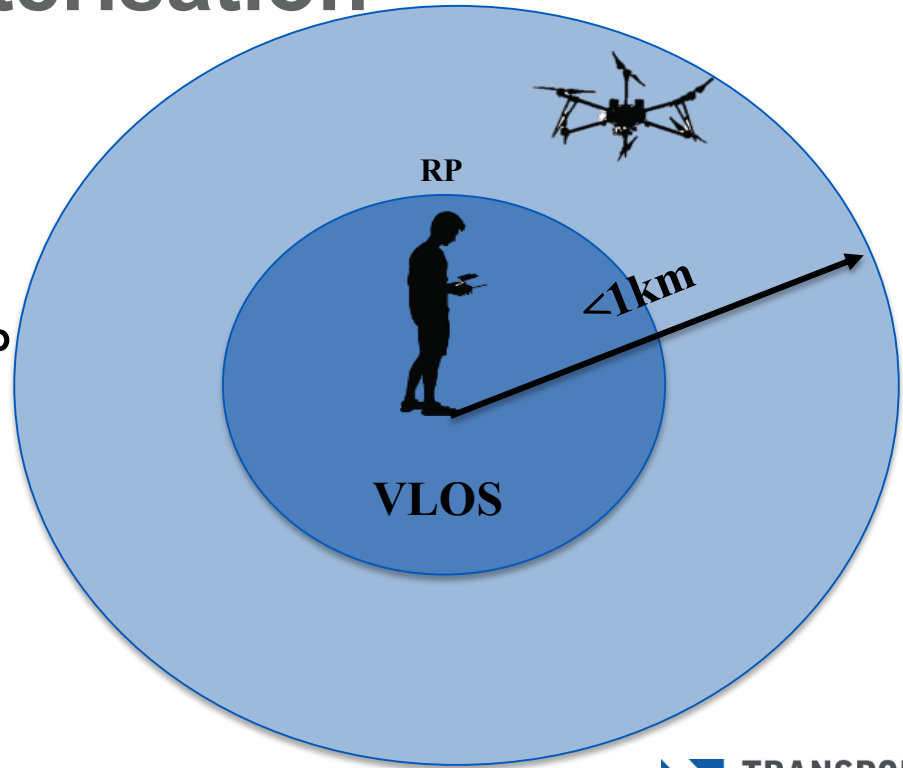
# Operational characterisation

- Level of human intervention
  - Inga autonoma operationer
  - RP operera endast en drönare åt gången
  - RP ej operera från fordon som rör sig
  - RP får ej ge över kontrollerna



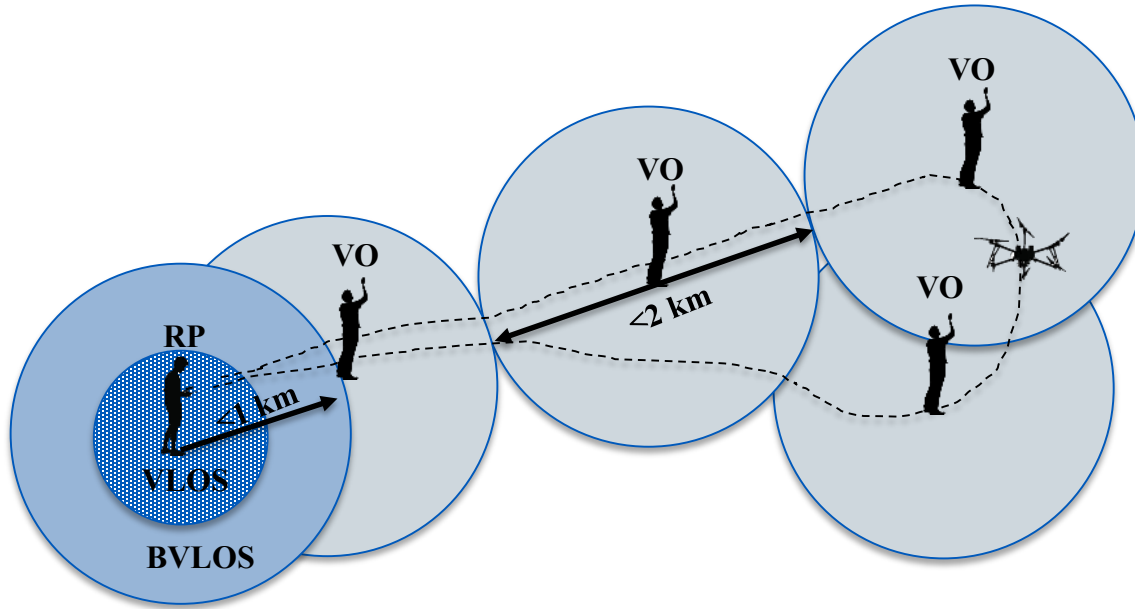
# Operational characterisation

- UA range limit
  - Start landning inom VLOS  
alt 'safe prepared area'
  - Flygning upp till 1km från RP
  - Flygning mer än 1km  
men max 1km från AO



# PDRA G-01 — SAIL II (AMC2 Article 11)

RP = remote pilot  
VO = visual observer



## BVLOS

Using a visual observers (VO)

No limit in the number of VOs however no gaps between the zones covered, needs to be ensured

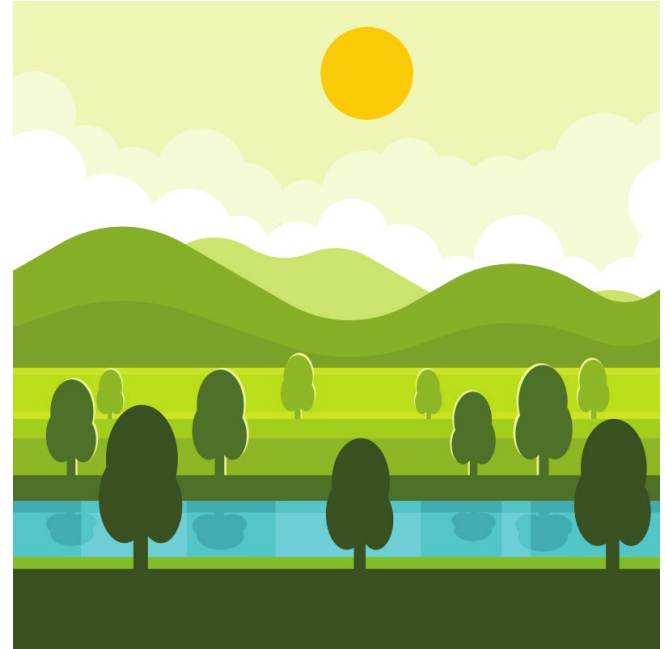
# Operational characterisation

- Areas overflown
  - Sparsely populated areas
- UA limitations
  - Max 3m
  - 34 kJ



# Sparsely populated

- Glesbefolkat
- Populated vs Congested i 2012/965
- 'congested area' means in relation to a city, town or settlement, any area which is substantially used for residential, commercial or recreational purposes



# 34 kJ

- Cruise speed – Fixed wing
- Terminal velocity – Other aircraft

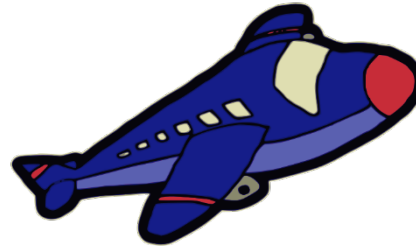
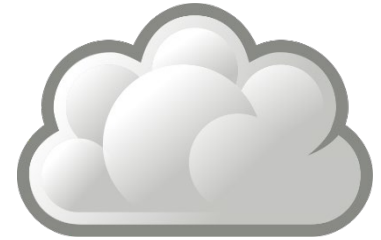


<https://www.grc.nasa.gov/WWW/K-12/airplane/termv.html>

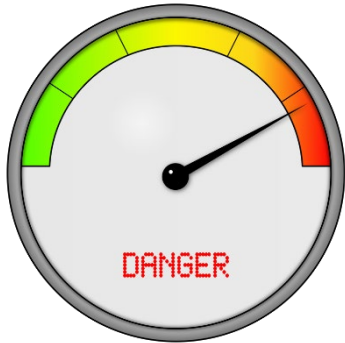


# Operational characterisation

- Flight height limit
  - Maxhöjd på OV är 150m (500ft) over marken.
- Airspace
  - Okontrollerat luftrum (G)
  - I ett segregerat område (ARC-a)
- Visibility
  - 5km
- Others
  - Dangerous goods i normalfallet <sup>17</sup>ej tillåtet



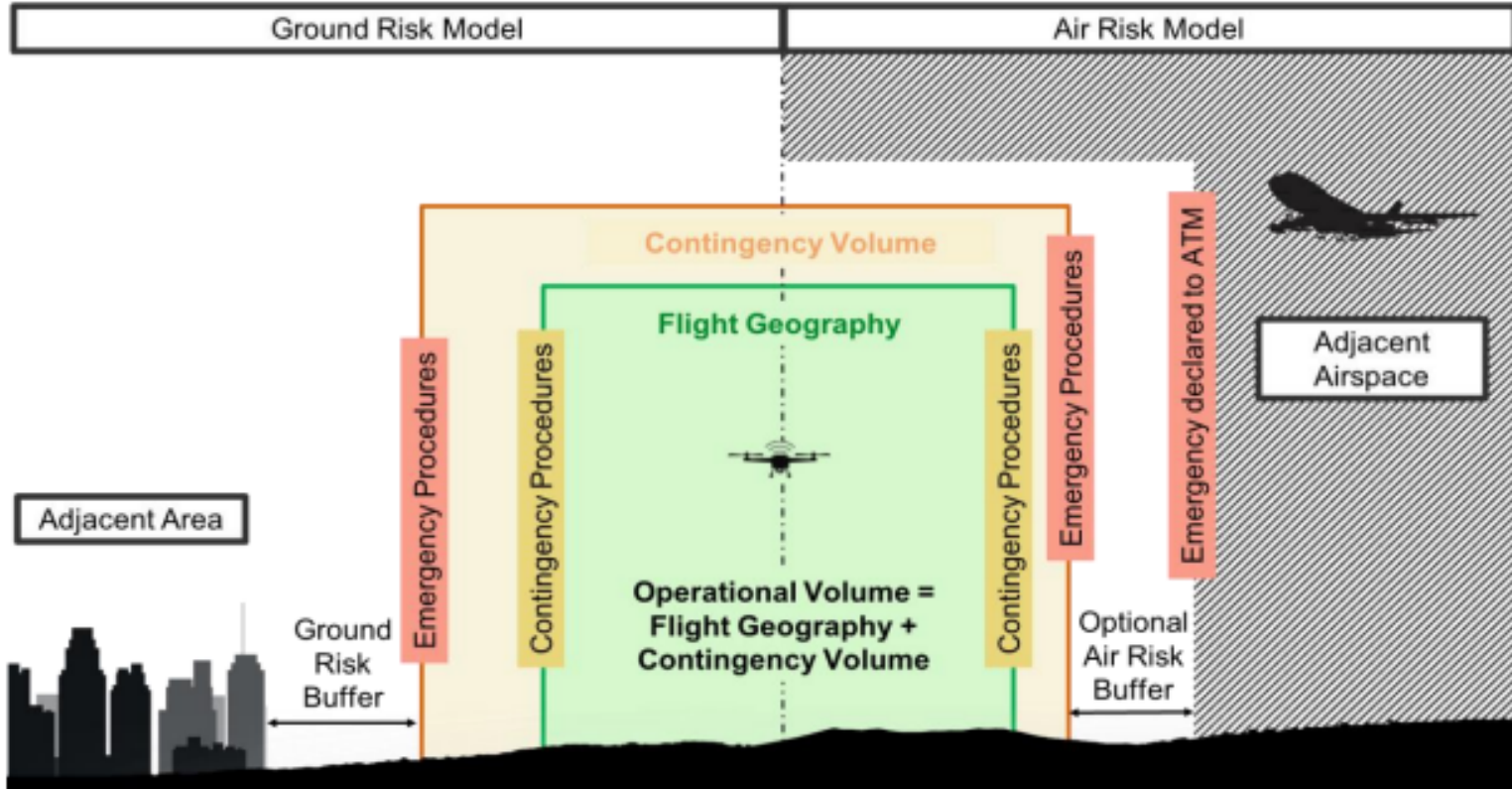
# Final GRC, Final ARC, SAIL



2. Operational risk classification (according to the classification defined in [AMC1 Article 11](#) of the UAS Regulation)

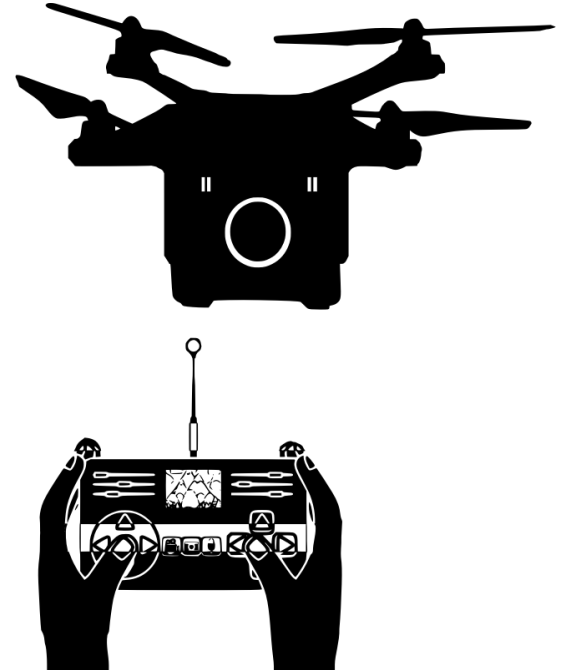
Final GRC	3	Final ARC	ARC-b	SAIL	II
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# Operational mitigations



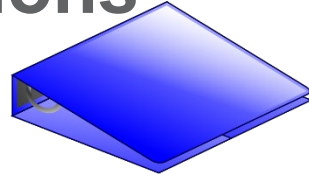
# Operational mitigations

- Ground risk
- Air risk
- Airspace Observers



# UAS operator and UAS operations provisions

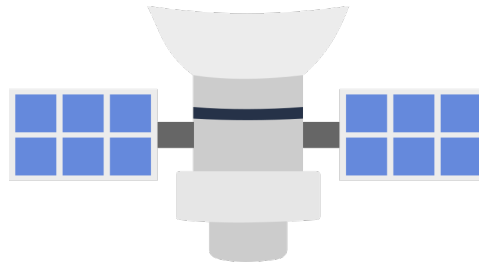
- **Operations manual + ERP**
  - Ensure adequacy of contingency and emergency procedures
  - Fit for flight policy
- **UAS maintenance**



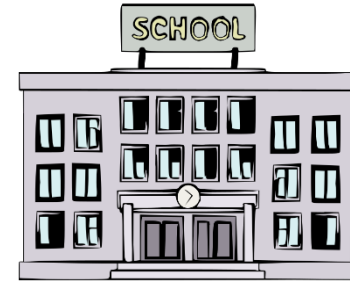
# UAS operator and UAS operations provisions

- **External services**

- ” The UAS operator should ensure that the level of performance for any externally provided service that is necessary for the safety of the flight is adequate for the intended operation. The UAS operator should declare that this level of performance is adequately achieved. “



# Provisions for the personnel in charge of duties essential to the UAS operation



- Utbildning enligt artikel 8
- The UAS operator should ensure that all the personnel in charge of duties essential to the UAS operation (i.e. any people involved in the operation) are provided with competency-based theoretical and practical training specific to their duties

# Technical provisions



- **General**
  - Position, Höjd, Fart, Attityd, Färdväg, Energistatus, Kritiska system (exempelvis radiolänk)
- **Human-machine interface (HMI)**
  - Skall vara pilotvänlig
  - Operatören skall göra utvärdering



# Technical provisions – C2 links and communication



- The UAS should comply with the applicable requirements for radio equipment and use of the RF spectrum
- Protection mechanisms against interference should be used, especially if unlicensed bands (e.g. ISM) are used for the C2 link
- Communication between the remote pilot and the AO(s) should allow the remote pilot to maneuver the UA with sufficient time to avoid any risk of collision with manned aircraft



# Technical provisions - Tactical mitigation

- The UAS design should be adequate to ensure that the time required between a command given by the remote pilot and the UA executing it does not exceed 5 seconds.
- Where an electronic means is used to assist the remote pilot and/or AOs in being aware of the UA position in relation to potential 'airspace intruders', the information is provided with a latency and an update rate for intruder data (e.g. position, speed, altitude, track) that support the decision criteria.

# Technical provisions - containment



## UAS operator should ensure that:

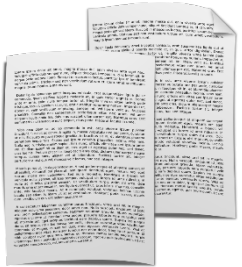
- No **probable** failure of the UAS or of any external system supporting the operation should lead to operation outside the operational volume; and
- It is reasonably expected that a fatality will not occur due to any **probable** failure of the UAS or of any external system supporting the operation.



# Technical provisions - containment



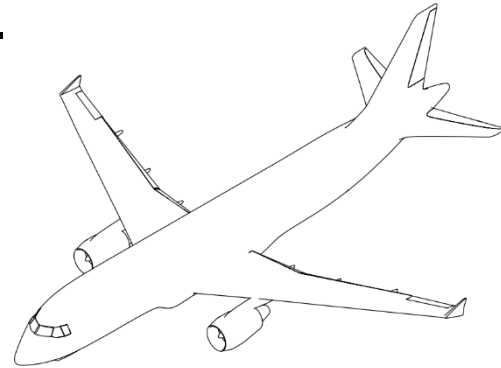
- A design and installation appraisal should be made available and should cover at least:
  - The design and installation features (independence, separation, and redundancy); and
  - The particular risks (e.g. hail, ice, snow, electromagnetic interference, etc.) relevant to the ConOps



# Technical provisions - containment



- Om närliggande luftrum är ARC-d eller närliggande område innehåller en folksamling så ställs hårdare krav på containment och mjukvara.



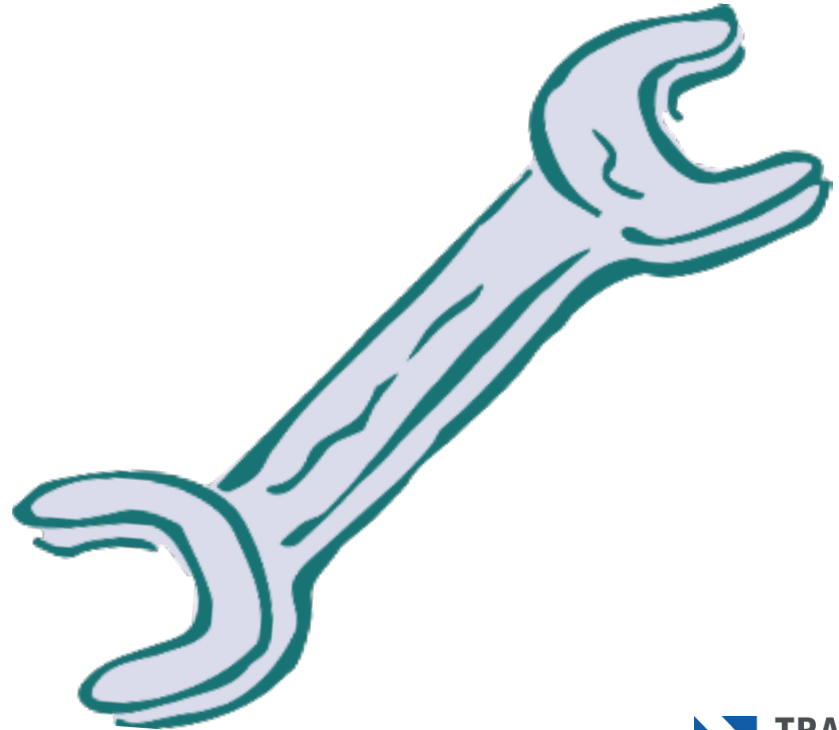
# Maintenance staff

**SAFETY FIRST**



**Safety  
Starts  
Here**

Think Safe...  
Work Safe...  
Be Safe



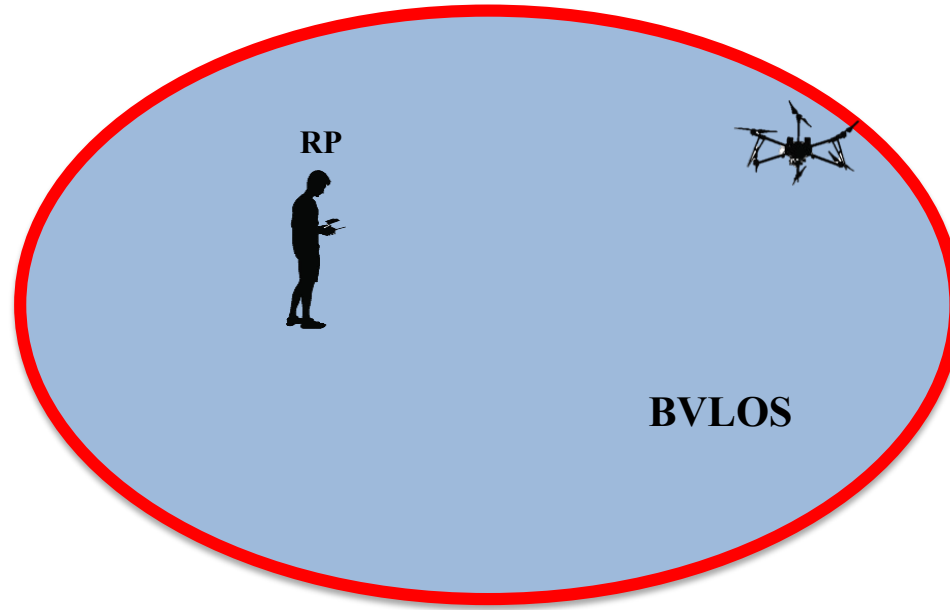
# Remote Pilot

- **The remote pilot has the authority to cancel or delay any or all flight operations under the following conditions:**
  - The safety of persons is threatened; or
  - Property on the ground is threatened; or
  - Other airspace users are in jeopardy; or
  - There is a violation of the terms of this authorisation



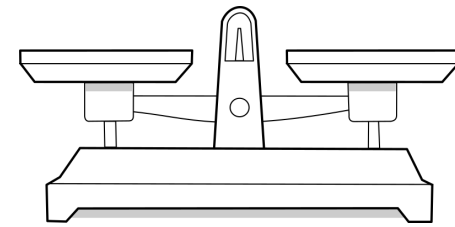
# PDRA G-02 — SAIL II (AMC3 Article 11)

Reserved airspace over sparsely populated area



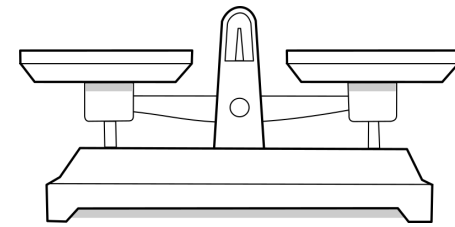


# Likheter PDRA G-01 & G-02



- Båda riskanalyserna bygger på flygning över **glesbefolkat område**
- Båda riskanalyserna medger flygning **BVLOS**
- Båda riskanalyserna har max **3m / 34 kJ** som max storlek/vikt

# Skilnader PDRA G-01 & G-02



- PDRA G-01 **innehåller avståndsgräns (1km/AO)**
  - PDRA G-02 använder radiolänkens räckvidd som gräns (ensure safe flight)
- PDRA G-01 innehåller **150m OV tak**
  - PDRA G-02 medger flygning inom det reserverade luftrummet.
- PDRA G-01 kan i första hand tillämpas i okontrollerat luftrum
  - PDRA G-02 tillämpas i reserverat luftrum

# Sammanfattning

- **PDRA som bygger på standardscenario**

- **S-01 & S-02**



- **PDRA generellt**

- **G-01 & G-02**



*The End*