EASA
European Union Aviation Safety Agency

Webinar
The specific category and the drone design verification process

EASA Drones team

07 May 2021

Your safety is our mission.

An Agency of the European Union

Do you want to learn more about the new design verification process for authorising #drone operations?

Antonio Marchetto

Natale di Rubbo

John Franklin

- Introduction to the specific category
- Design verification of drones operated in the specific category
- Questions and answers

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Put your questions using Slido

Follow the instructions shown below (type the code #E618). To put more questions to the drones team, email: drones@easa.europa.eu

→ SLI DO instructions

Established
2002

17 years
in operation

800+
aviation experts
& administrators

Headquarters in
Cologne
Office in
Brussels

32 EASA member states
= 28 + 4
EU + Switzerland, Norway
Iceland, Liechtenstein

EASA
European Union Aviation Safety Agency

EASA

European drone regulation applicable to all EASA MS [1] since 31 December 2020

[1]EASA MS= EU States + Switzerland, Norway, Iceland, Lichtenstein

Registration of UAS operators when using all drones <u>except</u>:

mass< 250gr
and no camera

<u>Toy</u> with mass< 250gr
even with a camera

Member State of residence or main place of business

Registration of drone only when a certificate of airworthiness is mandated

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Introduction to the specific category

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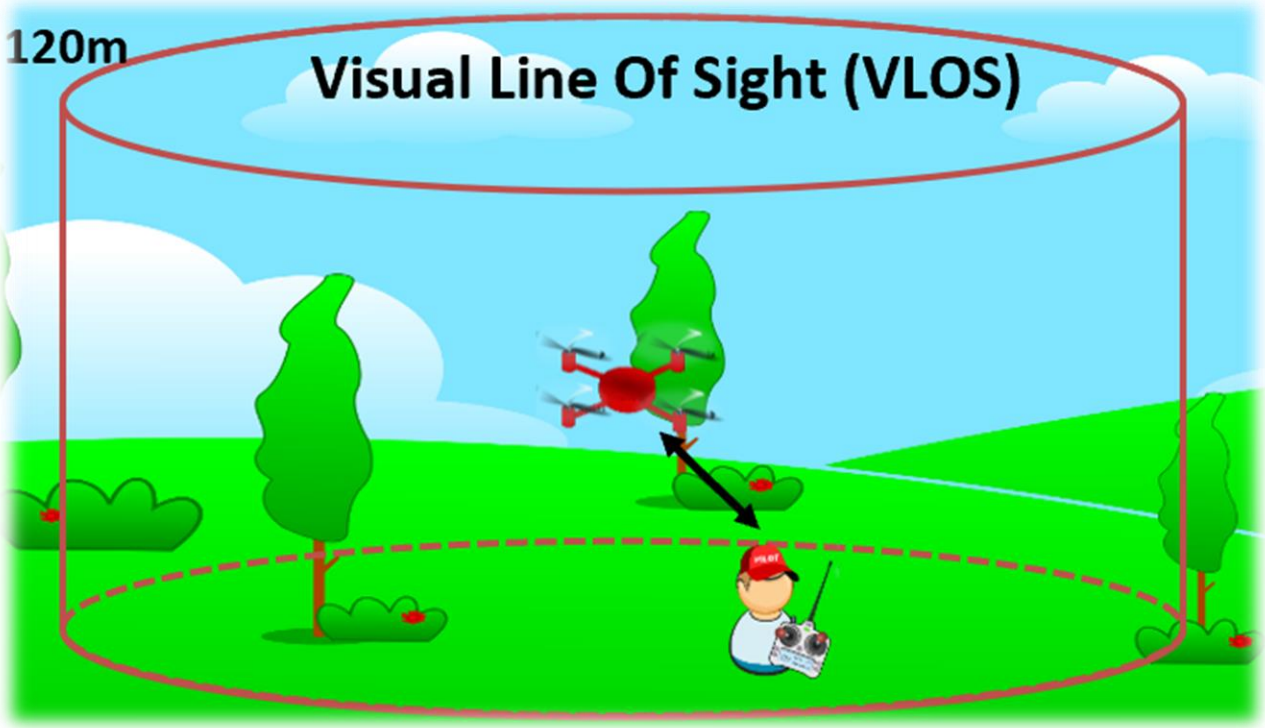
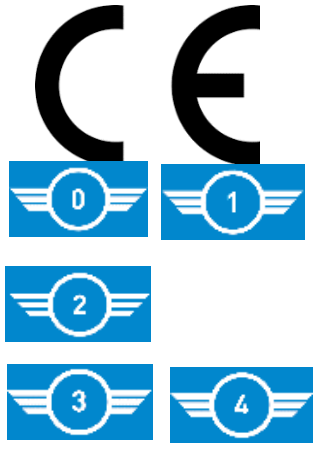
Open category



- A1 fly over people
- A2 fly close to people
- A3 fly far from people

Privately built with MTOM<250g

Privately built with MTOM<25kg



Specific category

UAS operation exceeding the limitations defined in the ‘open’ category.

Examples :

- Beyond Visual Line of Sight (BVLOS)
- using a drone with a weight > 25 kg
- higher than 120m
- with the purpose of dropping material

Traditional vs holistic approach

*Sizes of stones does not represent the ratio of costs

The ‘specific’ category

① SORA

https://www.easa.europa.eu/drones

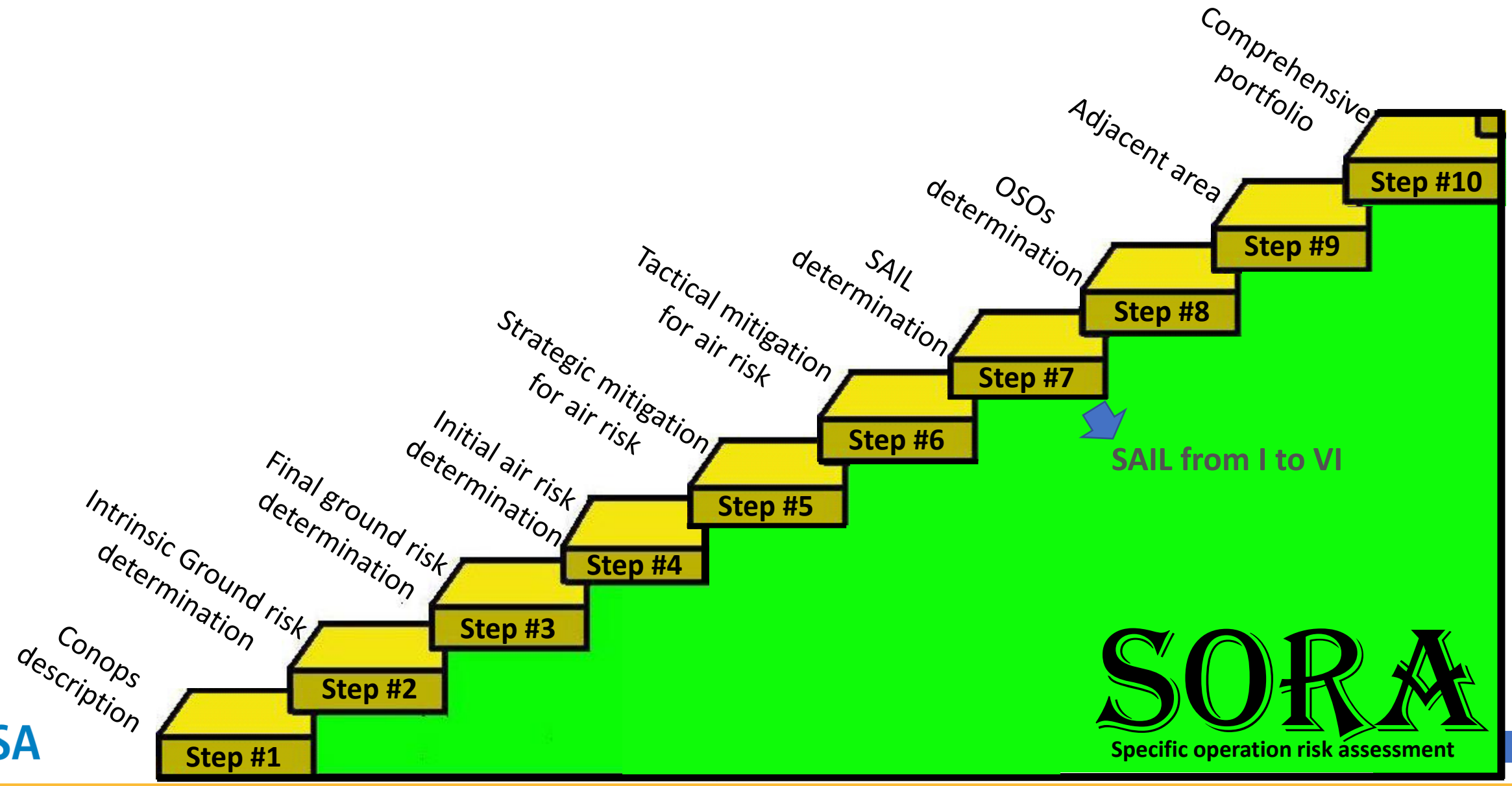
Apply for authorisation

Operational authorisation

Start the operation

[Easy Access Rules for Unmanned Aircraft Systems]

SORA methodology- 10 Steps



EASA

Verification of the design of the UAS

Low risk
(SAIL I and II)

- CE class mark for STS
- NAA may accept declaration of compliance or require operators to use UAS with design verification report issued by EASA (limited to containment or mitigation)
- Manufacturer may apply to EASA for a design verification report (limited to containment or mitigation)

Medium risk
(SAIL III and IV)

- NAA may require operators to use UAS with design verification report issued by EASA
- Manufacturer may apply to EASA for a design verification report or a (R)TC, issued according to Part 21

High risk
(SAIL V and VI)

- Mandatory (R)TC issued by EASA according to Part 21

The ‘specific’ category

① SORA

② Predefined risk assessment (PDRA)

③ Standard scenarios (STS)

④ Light UAS unamnned certificate (LUC)

Apply for authorisation

Declaration

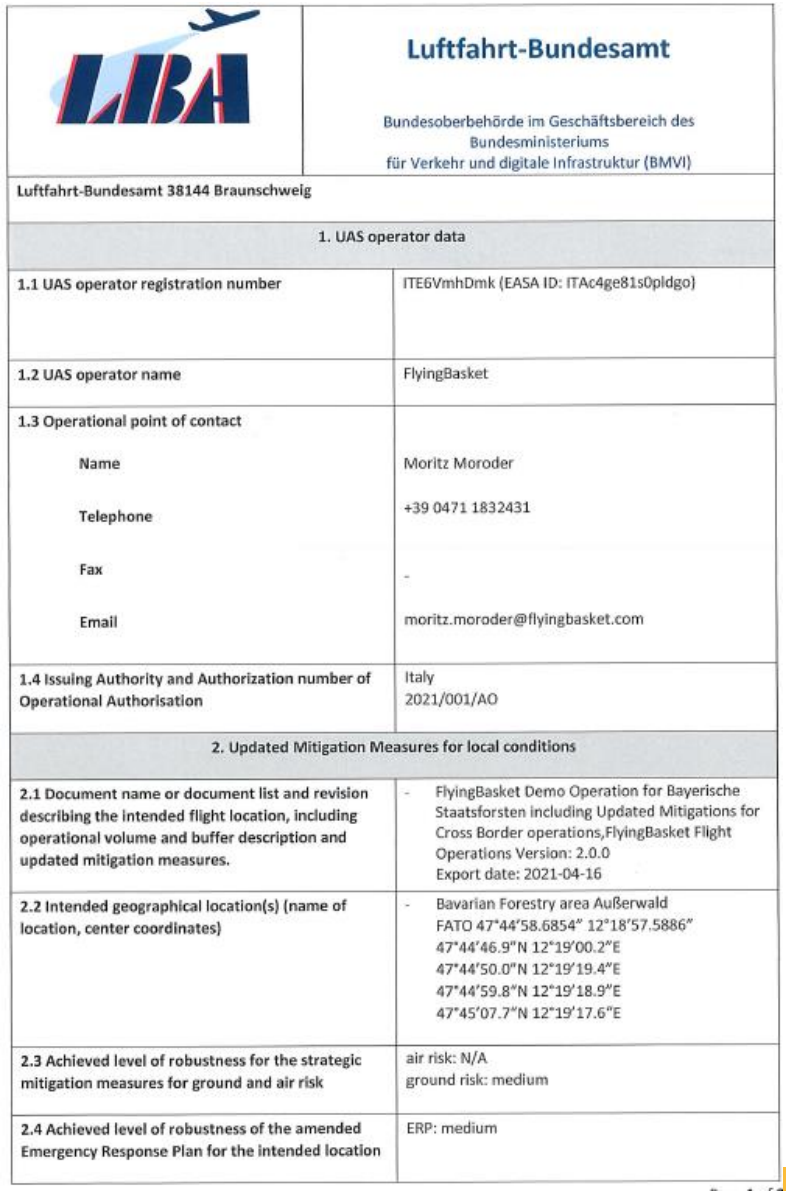
Privileges

Operational authorisation

Start the operation

EASA

The first recognition in multiple EU countries of an operational authorisation



Luftfahrt-Bundesamt Bundesoberbehörde im Geschäftsbereich des Bundesministeriums für Verkehr und digitale Infrastruktur (BMVI)	
Luftfahrt-Bundesamt 38144 Braunschweig	
1. UAS operator data	
1.1 UAS operator registration number	ITE6VmhDmk (EASA ID: ITAc4ge81s0pldgo)
1.2 UAS operator name	FlyingBasket
1.3 Operational point of contact Name Telephone Fax Email	 Moritz Moroder +39 0471 1832431 - moritz.moroder@flyingbasket.com
1.4 Issuing Authority and Authorization number of Operational Authorisation	Italy 2021/001/AO
2. Updated Mitigation Measures for local conditions	
2.1 Document name or document list and revision describing the intended flight location, including operational volume and buffer description and updated mitigation measures.	- FlyingBasket Demo Operation for Bayerische Staatsforsten including Updated Mitigations for Cross Border operations,FlyingBasket Flight Operations Version: 2.0.0 Export date: 2021-04-16
2.2 Intended geographical location(s) (name of location, center coordinates)	- Bavarian Forestry area Außerwald FATO 47°44'58.6854" 12°18'57.5886" 47°44'46.9"N 12°19'00.2"E 47°44'50.0"N 12°19'19.4"E 47°44'59.8"N 12°19'18.9"E 47°45'07.7"N 12°19'17.6"E
2.3 Achieved level of robustness for the strategic mitigation measures for ground and air risk	air risk: N/A ground risk: medium
2.4 Achieved level of robustness of the amended Emergency Response Plan for the intended location	ERP: medium

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Design verification of drones operated in the specific category

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Scope: Design elements

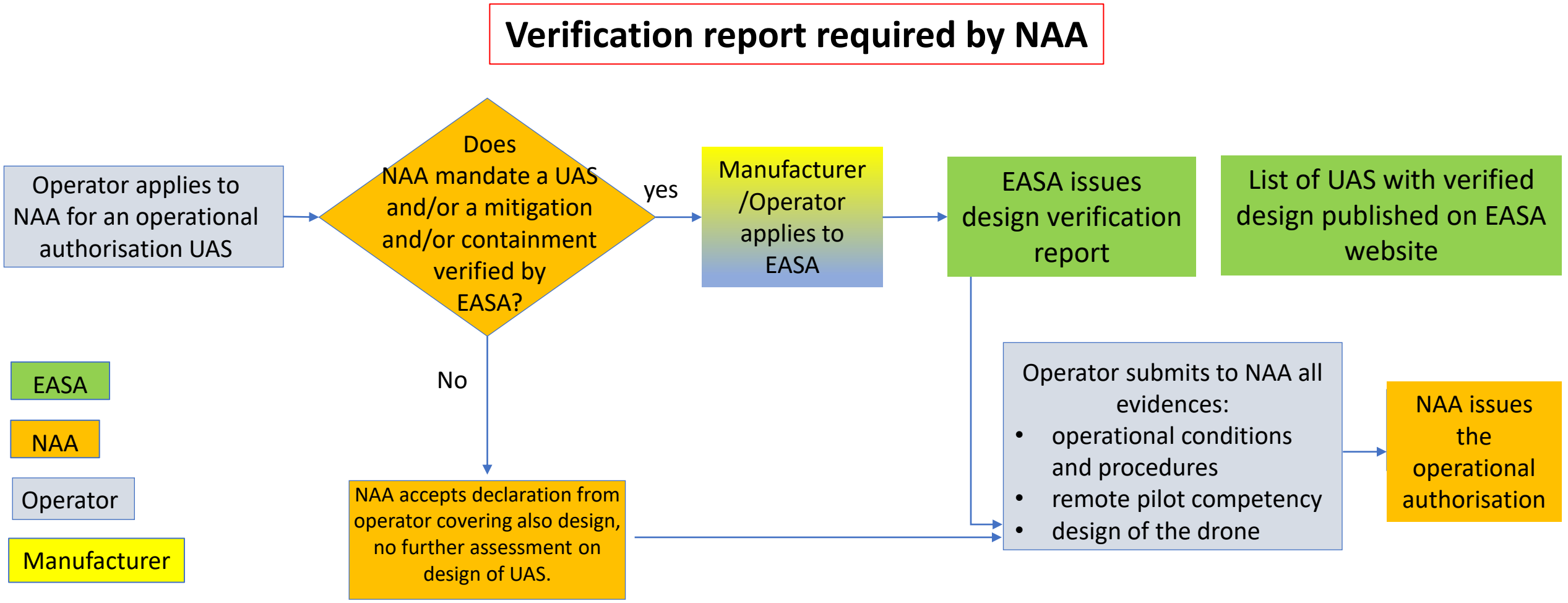
→ Technical mitigations

→ Design related OSOs

Enhanced Containment
(SORA step 9)

OSO number		SAIL					
		I	II	III	IV	V	VI
	Technical issue with the UAS						
OSO#02	UAS manufactured by competent and/or proven entity (design)	O	O	**L**	**M**	H	H
OSO#04	UAS developed to authority recognised design standards	O	O	**L**	**L**	M	H
OSO#05	UAS is designed considering system safety and reliability	O	O	**L**	**M**	H	H
OSO#06	C3 link performance	O	L	**L**	**M**	H	H
OSO#10	Safe recovery from a technical issue	L	L	**M**	**M**	H	H
OSO#12	UAS designed to manage the deterioration of external systems supporting UAS operations	L	L	**M**	**M**	H	H
OSO#13	External services supporting UAS operations	L	L	**M**	**H**	H	H
OSO#18	Automatic protection of the flight envelope	O	O	**L**	**M**	H	H
OSO#19	Safe recovery from human error	O	O	**L**	**M**	M	H
OSO#20	A human factors evaluation	O	L	**L**	**M**	M	H
OSO#24	adverse environmental conditions	O	O	**M**	**H**	H	H
Technical mitigations							
M2	**M2 — Effects of ground impact are reduced**	**Level of robustness M, H**					
Step #9 – Adjacent area/airspace considerations							
	Containment						

Process


Verification report required by NAA
Operator applies to NAA for an operational authorisation UAS
Does NAA mandate a UAS and/or a mitigation and/or containment verified by EASA?
yes
No
Manufacturer /Operator applies to EASA
EASA issues design verification report
List of UAS with verified design published on EASA website
Operator submits to NAA all evidences:
• operational conditions and procedures
• remote pilot competency
• design of the drone
NAA issues the operational authorisation
NAA accepts declaration from operator covering also design, no further assessment on design of UAS.
EASA
NAA
Operator
Manufacturer

Process

Manufacturer voluntary applies for a verification report

EASA

Operator

Manufacturer

Application

Who can apply

- → Any natural or legal person capable to demonstrate design compliance of the UAS, mitigation means, containment (as applicable)
- → Conditions for eligibility:
  - → UAS operated up to SAIL IV
  - → General acceptability of design in relation to the conops

Required knowledge to apply

- → technical know-how about the UAS design aspects linked with the scope of the application or access to relevant design data
- → ability to assess compliance with the technical requirements
- → capacity to perform test activities in a controlled manner for the intended investigation scope (mitigation, containment and / or full design)

Application

How to apply

- EASA will publish an application form
- The form will indicate the documents to be provided with the application:
  - detailed description of the design, including all the configurations to be verified;
  - CONOPS
  - risk assessment according to SORA
  - design verification basis;
  - a design verification program for the demonstration of compliance
  - project schedule, including the major milestones

Design verification basis

- The design verification basis should be developed starting from the SC Light UAS
  - identifying applicable requirements according to scope of the CONOPS and risk assessment
- Design verification basis may cover one or more of the following:
  - mitigation means linked with the design;
  - enhanced containment function
  - full design of the UAS

Design verification process

- For each element of the design verification basis applicant needs to provide a Means of Compliance (MoC)
  - MoC might be based on traditional means (as analisys, lab test etc..) or on extensive functional tests
- Organisational measures (design process, configuration control, etc.) may be checked
- EASA might witness parts of the tests, perform design inspections and compliance reviews
- Verification scope set to ensure consistency with the CONOPS and related safety considerations (UAS design, containment performance, integrity of mitigation means, …)

Content of the design verification report

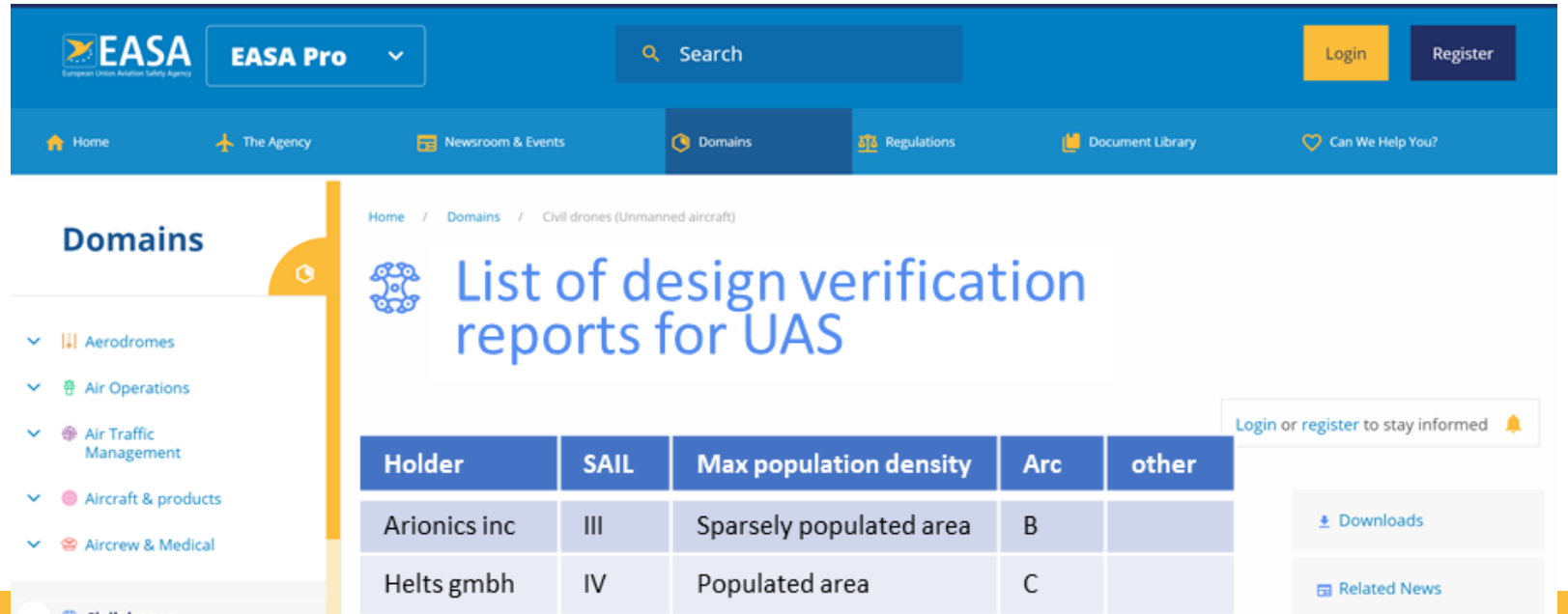
The design verification report will include:

- Reference to applicable documents from the manufacturer
- Suitable SAIL, Ground and Air Risk class, operational environment
- Conditions / limitations under which the design is expected to perform adequately including as applicable e.g.
  - minimum ground/air buffers
  - Limits for density of population
  - RF environment
  - …
  - Specific elements regarding CAW

- Design Verification Report is a not a type certificate – recognition only inside EASA MSs

Who can use the design verification report

- EASA will publish the list of design verification reports (with main data, similar to STC list)
- Design verification report can be shared by the holder
- Verified designs can be used by any operator in EASA MS and, if the UAS is operated within the conditions defined by EASA, no additional EASA involvement is needed
- UAS operator responsible to demonstrate to NAA compliance with all remaining OSOs, including production (OSO#1) and continuing AW (OSO#3)



Type certificate according to Part 21

- According to Art 40 of regulation 2019/947, NAA may mandate in the operational authorization to use a UAS complaint with Part 21 and Regulation (EU) 1321/2014 (continuing AW)
  - Considered not proportionate for UAS operated in SAIL III and IV
  - NAA should require a TC or RTC only for UAS operated in SAIL V and VI

- Manufacturer may voluntary apply for a TC or RTC for UAS intended to be operated in SAIL III or higher
  - It may help business strategy to have a design recognized outside of EU civil system
  - Regulation (EU) 1321/2014 (continuing AW) will not be applicable, unless required by the NAA in the operational authorization
  - DOA and POA is required

Cost of the design verification report

- Hourly based
- Only actual time spent on the project will be charged
- Depending on the CONOPS and SAIL the scope of the EASA verification may be very different
  - Limited assessments expected to trigger lower ceiling
  - More complex projects require dedicated assessment
  - Charged by hourly fees, but it is expected to not exceed 180hrs (except for complex projects)
  - EASA efforts highly dependent on the completeness and adequateness of information from the applicant

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Questions

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