Webinar
The specific category and the drone design verification process

EASA Drones team
07 May 2021
Do you want to learn more about the new design verification process for authorising #drone operations?

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

→ SLIDO instructions

Join at
slido.com
#E618
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

European Union Aviation Safety Agency
European drone regulation applicable to all EASA MS\textsuperscript{1} since 31 December 2020

\textsuperscript{1}EASA MS= EU States + Switzerland, Norway, Iceland, Lichtenstein
Registration of UAS operators when using all drones except:

- mass < 250gr and no camera
- Toy with mass < 250gr even with a camera

Registration of drone only when a certificate of airworthiness is mandated.
Introduction to the specific category
Open category

• A1 fly over people
  - Privately built with MTOM < 250g
• A2 fly close to people

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. Apply for authorisation
2. Operational authorisation
3. Start the operation

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

Easy Access Rules for Unmanned Aircraft Systems
SORA methodology - 10 Steps

1. Conops description
2. Intrinsic Ground risk determination
3. Final ground risk determination
4. Initial air risk determination
5. Strategic mitigation for air risk
6. Tactical mitigation for air risk
7. SAIL determination
8. OSOs determination
9. Adjacent area portfolio
10. Comprehensive portfolio

SORA
Specific operation risk assessment

SAIL from I to VI
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
   - Risk Assessment

2. Predefined risk assessment (PDRA)

3. Standard scenarios (STS)

4. Light UAS unmanned certificate (LUC)

- Apply for authorisation
- Declaration
- Privileges
- Operational authorisation
- Start the operation
The first recognition in multiple EU countries of an operational authorisation

<table>
<thead>
<tr>
<th>1. UAS operator data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 UAS operator registration number</td>
</tr>
<tr>
<td>1.2 UAS operator name</td>
</tr>
<tr>
<td>1.3 Operational point of contact</td>
</tr>
<tr>
<td>Name</td>
</tr>
<tr>
<td>Telephone</td>
</tr>
<tr>
<td>Email</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Issuing Authority and Authorisation number of Operational Authorisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>July</td>
</tr>
<tr>
<td>2021/00010</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Updated Mitigation Measures for relevant conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Document name or document list and reluctant describing the intended flight location, including operational volume and buffer description and updated mitigation measures.</td>
</tr>
<tr>
<td>Export date</td>
</tr>
<tr>
<td>2.2 Intended geographical location(s) (name of location, center coordinates)</td>
</tr>
<tr>
<td>Location</td>
</tr>
<tr>
<td>Coordinates</td>
</tr>
<tr>
<td>2.3 Achieved level of robustness for the strategic mitigation measures for ground and air risk</td>
</tr>
<tr>
<td>ground risk</td>
</tr>
<tr>
<td>2.4 Achieved level of robustness of the annexed Emergency Response Plan for the intended location</td>
</tr>
</tbody>
</table>
Design verification of drones
operated in the specific category
## Scope: Design elements

- Technical mitigations
- Design related OSOs

### Enhanced Containment (SORA step 9)

<table>
<thead>
<tr>
<th>OSO number</th>
<th>Description</th>
<th>SAH</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>I II III IV V VI</td>
</tr>
<tr>
<td>OSO#02</td>
<td>UAS manufactured by competent and/or proven entity (design)</td>
<td>O O L M H H</td>
</tr>
<tr>
<td>OSO#04</td>
<td>UAS developed to authority recognised design standards</td>
<td>O O L L M H</td>
</tr>
<tr>
<td>OSO#05</td>
<td>UAS is designed considering system safety and reliability</td>
<td>O O L M H H</td>
</tr>
<tr>
<td>OSO#06</td>
<td>C3 link performance</td>
<td>O L L M H H</td>
</tr>
<tr>
<td>OSO#10</td>
<td>Safe recovery from a technical issue</td>
<td>L M M M H H</td>
</tr>
<tr>
<td>OSO#12</td>
<td>UAS designed to manage the deterioration of external systems supporting UAS operations</td>
<td>L L M M H H</td>
</tr>
<tr>
<td>OSO#13</td>
<td>External services supporting UAS operations</td>
<td>L L M H H H</td>
</tr>
<tr>
<td>OSO#18</td>
<td>Automatic protection of the flight envelope</td>
<td>O O L M H H</td>
</tr>
<tr>
<td>OSO#19</td>
<td>Safe recovery from human error</td>
<td>O O L M M H</td>
</tr>
<tr>
<td>OSO#20</td>
<td>A human factors evaluation</td>
<td>O L L M M H</td>
</tr>
<tr>
<td>OSO#24</td>
<td>adverse environmental conditions</td>
<td>O O M H H H</td>
</tr>
</tbody>
</table>

### Technical mitigations

- M2 — Effects of ground impact are reduced
- Step #9 — Adjacent area/airspace considerations

### Level of robustness M, H
Process

Does NAA mandate a UAS and/or a mitigation and/or containment verified by EASA?

- **Yes**: Manufacturer / Operator applies to EASA
  - EASA issues design verification report
  - List of UAS with verified design published on EASA website

- **No**: Operator applies to NAA for an operational authorisation UAS
  - NAA accepts declaration from operator covering also design, no further assessment on design of UAS.
  - Operator submits to NAA all evidences:
    - operational conditions and procedures
    - remote pilot competency
    - design of the drone
  - NAA issues the operational authorisation
Manufacturer voluntary applies for a verification report

Manufacturer applies to EASA → EASA issues design verification report → List of UAS with verified design published on EASA website
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 analysis, 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, ...)

EASA
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
Questions