



**Joint Authorities for Rulemaking of Unmanned Systems**

# **JARUS OPS A & B**

## **Recommendations for Unmanned Aircraft Systems (UAS)**

### **Category A & Category B Operations**

**DOCUMENT IDENTIFIER : JAR\_DEL\_WG2\_D.04**

<b>Edition Number</b>	:	<b>1.0</b>
<b>Edition Date</b>	:	<b>11 July 2019</b>
<b>Status</b>	:	<b>Final / Public Release</b>
<b>Intended for</b>	:	<b>Publication</b>
<b>Category</b>	:	<b>For approval</b>
<b>WG</b>	:	<b>2</b>

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# DOCUMENT CHARACTERISTICS

TITLE		
<b>JARUS OPS Categories A &amp; B</b>		
Recommended requirements for UAS Category A and B Operations		
<b>Publications Reference:</b>		JAR_doc_14_CAT_A_B
		<b>ID Number:</b> D.4
<b>Document Identifier</b>	<b>Edition Number:</b> 1.0	
<b>JAR_DEL_WG2_D4_OPS_Cat_A&amp;B</b>	<b>Edition Date:</b> 11.07.2019	
Abstract		
<p>This JARUS OPS A &amp; B contains recommended rules for UAS operations in Category A (Low Risk) and Category B (Medium Risk).</p> <p>This JARUS OPS A contains recommended rules for UAS operations in (low risk) Category A. In this category no administrative procedures involving the competent aviation authority are envisaged, beyond registration, identification and safety data collection and analysis.</p> <p>JARUS OPS B contains recommended requirements to perform UAS Operations in Category B (medium risk), which requires an operational risk assessment before conducting the operation. Following a risk-based approach, the UAS operator must declare compliance with a standard scenario, request and receive authorization from the competent authority for one or a series of operations, or hold a UAS Operator Certificate (UOC). In addition, JARUS OPS B proposes technical requirements and administrative procedures for the implementation of the relevant concepts of registration, electronic identification and geo-awareness.</p> <p>Following the JARUS Internal and External consultation process, Working Group 2 (Operations), experts from several JARUS Member States have consolidated the content of the “<i>JARUS Recommendations for UAS Categories A and B Operations</i>”.</p> <p>Developed and consolidated through internal and external consultation the present structure allows its integration into National Legislation.</p>		
Keywords		
JARUS, UAS, Unmanned aircraft		
<b>Contact Person(s)</b>	<b>Tel</b>	<b>Unit</b>
Alex de la Torre González & Zia Meer		
STATUS, AUDIENCE AND ACCESSIBILITY		
Status	Intended for	Accessible via
Working Draft	<input type="checkbox"/> General Public	<input checked="" type="checkbox"/> Intranet <input type="checkbox"/>
Draft	<input type="checkbox"/> JARUS members	<input type="checkbox"/> Extranet <input type="checkbox"/>
Proposed Issue	<input type="checkbox"/> Restricted	<input type="checkbox"/> Internet ( <a href="http://jarus-rpas.org">http://jarus-rpas.org</a> ) <input checked="" type="checkbox"/>
Released Issue	<input checked="" type="checkbox"/> External consultation	<input type="checkbox"/>

## DOCUMENT APPROVAL

The following table identifies the process successively approving the present issue of this document before public publication.

PROCESS	NAME AND SIGNATURE WG leader	DATE
Publication CAT A	Ron van De Leijgraaf Liu Hao	20/07/2018
Publication CAT B	Alex de la Torre González Zia Meer	02/05/2019
Publication consolidated document CAT A & B	Alex de la Torre González Zia Meer	11/07/2019

## DOCUMENT CHANGE RECORD

The following table records the complete history of the successive editions of the present document.

EDITION NUMBER	EDITION DATE	REASON FOR CHANGE	PAGES AFFECTED
1.0	11/07/2019	Consolidated document CAT A & B	All

**JARUS**

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# Explanatory Note

## Recommended Requirements for UAS Category A and Category B Operations

The Joint Authorities for Rulemaking on Unmanned Systems, recommend the requirements contained in this JARUS-OPS A & B for global harmonisation of rules concerning operations of Unmanned Aircraft Systems (UAS) in Category A ('open') and Category B ('specific').

JARUS OPS A & B propose technical requirements and administrative procedures for civil use of UA covering three processes:

- a) Registration and identification of UAS intended for civil use, having a mass of 250 grams or more;
- b) Rules for operation of UAS not in the scope of ICAO SARPs, in two categories:
  - Category A - Operations of UA of less than 25 kg maximum take-off mass (MTOM), subject to proportionate operational limitations and requirements, in which the NAA is involved only for registration process;
  - Category B - Operations of UA (autonomous or remotely piloted) subject to a process of declaration or authorisation, based on a risk assessment (SORA), or in accordance with UOC (UAS Operator Certificate);
- c) Rules for UA to access airspace.

Recommended rules for Category A apply to toy aircraft, model aircraft, recreational flights, private operations, non-commercial air transport as well as commercial or non-commercial aerial work.

The following, unless prescribed by the NAA, are excluded from Category A operations: Autonomous operations, dropping of objects, spraying of products, transport of dangerous goods and commercial air transport.

A State may wish to further subdivide Category A into subcategories and this document provides guidance in that respect.

Category B requires a risk assessment (SORA), carried out by the Authority (i.e. 'standard scenario') or submitted by the Operator, but neither mandatory Certificate of Airworthiness (CofA) or mandatory licence for the remote pilot is required.

Category C is subject to airworthiness certification, licensing of Remote Pilots and certification of the Operator.

JARUS-ORG covers organisational requirements such as safety management, security, training requirements, subcontractor requirements and which are not addressed within the scope of this document.

The UAS Operator will have to comply with the rules applicable to the UAS operations in the State where operations are conducted. In addition, the Operator shall comply also with relevant applicable rules related to security, privacy, data protection, liability, insurance and environmental protection.

This document recommends associations and clubs continue operation of model aircraft according to their long-established practices. This does not exclude individuals flying toy or model aircraft in Category A without being affiliated to any club or association.

Transposition of these recommended requirements may ensure compliance with Article 8 of the Chicago Convention (pilotless aircraft). On the basis of bilateral or multilateral agreements, national or regional law, international operations in Categories A and B may be allowed, even if they are beyond the scope of ICAO SARPs.



## 1.1 References

- [1] JARUS, JAR doc 09, RPAS Operational Categorization, Appendix A (under development on 31 July 2017)
- [2] JARUS, JAR doc 06, Specific Operations Risk Assessment (SORA) <http://jarus-rpas.org/content/jar-doc-06-sora-package>
- [3] Federal Aviation Administration (FAA), Registration and Marking Requirements for Small Unmanned Aircraft, Interim final rule of 14 December 2015, 14 CFR Parts 1, 45, 47, 48, 91, and 375
- [4] Federal Aviation Administration (FAA), 14 CFR Parts 21, 43, 45, 47, 61, 91, 101,107, and 183
- [5] European Commission (EC), Proposal for a Regulation of the European Parliament and of the Council on common rules in the field of civil aviation and establishing a EU Aviation Safety Agency, and repealing Regulation (EC) No 216/2008 of the European Parliament and of the Council, COM(2015) 613 final of 7 December 2015
- [6] EASA NPA 2017-05 of 04 May 2017: Introduction of a regulatory framework for the operation of drones — Unmanned aircraft system operations in the open and specific category
- [7] EUROCONTROL RPAS ATM concept v4.0  
<http://www.eurocontrol.int/sites/default/files/publication/files/rpas-atm-cocept-of-operations-2017.pdf>
- [8] Subpart K in Commission Regulation (EU) No 748/2012 of 3 August 2012 laying down implementing rules for the airworthiness and environmental certification of aircraft and related products, parts and appliances, as well as for the certification of design and production organisations
- [9] JARUS, JAR doc 01, Certification Specification for Light Unmanned Rotorcraft Systems
- [10] JARUS, JAR doc 05, Certification Specification for Light Unmanned Aeroplane Systems
- [11] Eurocae, Terms of Reference WG 105 on Unmanned Aircraft Systems (UAS), approved 29 September 2016
- [12] ASTM standard F2910 on design, construction, and test of small UAS
- [13] Regulation (EU) No 376/2014 of the European Parliament and of the Council of 3 April 2014 on the reporting, analysis and follow-up of occurrences in civil aviation, amending Regulation (EU) No 996/2010 of the European Parliament and of the Council and

- repealing Directive 2003/42/EC of the European Parliament and of the Council and Commission Regulations (EC) No 1321/2007 and (EC) No 1330/2007
- [14] Regulation (EC) No 785/2004 of the European Parliament and of the Council of 21 April 2004 on insurance requirements for air carriers and aircraft Operators
- [15] 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)
- [16] South Africa Civil Aviation Regulation (2011) Part 101 RPAS
- [17] EASA Opinion 01/2018, Unmanned aircraft system (UAS) operations in the 'open' and 'specific' categories, <https://www.easa.europa.eu/document-library/opinions/opinion-012018>

## 1.2 Recommended JARUS-OPS A & B

[State] CIVIL AVIATION REGULATION No .../..

of XXX

laying down rules for Unmanned Aircraft Systems (UAS)

The Civil Aviation Administration of the State of .....,

Having regard to the Civil Aviation Law No. Xx of dd/mm/yyyy, and in particular to Articles XX, YY and ZZ, thereof,

### Whereas:

- (1) Pursuant to the Civil Aviation Law No. xx of dd/mm/yyyy, the Civil Aviation Authority of [State] (hereinafter referred to as the 'NAA'), is empowered to adopt the necessary implementing regulations for the design, production, maintenance and operation of unmanned aircraft, their engines, propellers, parts and appliances, as well as the equipment to control unmanned aircraft remotely, where such aircraft are operated within the [State] airspace.
- (2) The definition of aircraft includes manned and unmanned aircraft, according to paragraph 2.2 of Annex 7 (6<sup>th</sup> edition including amendment 6) to the Chicago Convention.
- (3) Civil Aviation Law identifies the Operator as a legal or natural person operating or proposing to operate one or more aircraft, whether manned or unmanned.
- (4) Measures taken in the framework of this Regulation should be proportionate to the nature and risk of the type of unmanned aircraft operation and should mitigate the risk for persons and property on the surface, other airspace users and critical infrastructures on the territory overflown.
- (5) Rules should be based on risk assessment and be performance-based, with Acceptable Means of Compliance (AMC) developed as far as possible by industry.
- (6) In accordance with the ICAO RPAS Manual (Doc 10019; 1<sup>st</sup> edition; par. 2.3.5) the distinction between commercial and private flights is not considered relevant for UAS. Regulatory distinctions should be based on scale and complexity of operation, rather than on the traditional types of operation or only on mass or kinetic energy of aircraft.

- (7) The State of ..... is member of the Joint Authorities for Rulemaking on Unmanned Systems (JARUS) and JARUS has recommended to regulate three categories of UAS operations: A (low risk; open), B (medium risk; specific) and C (high risk; certified).
- (8) The high-risk operations of unmanned aircraft should be regulated by similar rules as for manned aircraft, which include the certification of the aircraft, the licensing of the remote pilot and the certification of the Operator, in compliance with applicable ICAO standards. The introduction of the regulatory framework to accommodate operations in such 'Certified' (Category C) will be considered in future editions of these rules.
- (9) The lower risk operations, subject to the present Regulation, should be regulated by specific risk-based requirements leading to proportionate administrative procedures, simpler in comparison to administrative procedures applicable to manned aviation. For these operations, which are subdivided into two categories (the Categories A and B), proportionate requirements should be applicable and adapted to the level of risks inherent to the category of operation.
- (10) Consequently, it is necessary to establish rules for the registration and identification of unmanned aircraft, not only for safety, but also for security reasons.
- (11) Rules for the management, safety and security of the organisations responsible for operations of UAS, training of Remote Pilots, maintenance of UAS or service provision for UAS will be covered in separate regulations.
- (12) NAA may itself conduct or delegate to accredited delegated entities independent from Operators and their associations, as well as from training organisations and manufacturers, all necessary inspections of unmanned aircraft, including assessment of persons and organisations involved in their design, production, maintenance, operations and service provision.
- (13) Operators of UAS registered in a State other than [State] in the B category, should be eligible to apply for the special authorisation to enter the [State] airspace, subject to procedures covered by bilateral or multilateral intergovernmental agreements or arrangements, as suggested by paragraph 3.2.2 of the ICAO RPAS Manual (Doc 10019; first edition; 2015).
- (14) Annex 2 (Rules of the Air; 10<sup>th</sup> edition including amendment 44) to the Chicago Convention contains different minimum flight heights above surface level, the lowest of which is 500 ft (150 m) for normal VFR flights outside urban areas. The ICAO standards however allow States to establish specific procedures to authorise flights below standard heights.

- (15) To ensure a smooth transition and to avoid disruptions, appropriate transitional measures should be provided.
- (16) The evolution of the regulatory framework for civil unmanned aircraft, as well as related technologies and industry standards are rapidly evolving and hence this regulation should be subject to future amendments.

## **Article 1 – Subject matter and scope**

### 1. This Regulation lays down:

- a) risk-based rules for the operation of civil unmanned aircraft systems (UAS), and more specifically in categories A and B, within the [State] airspace;
- b) technical requirements and administrative procedures for the design, production and maintenance of UAS in Categories A and B within [State], including their engines, propellers, parts and appliances, as well as the equipment to control unmanned aircraft remotely;
- c) technical requirements and administrative procedures for the implementation of the concepts of registration, electronic identification, and geo-awareness;
- d) requirements for subcategories in Category A;
- e) conditions to issue a declaration or to obtain an authorisation, as appropriate, in Category B; and
- f) requirements for the introduction of the concept of standard scenarios in Category B.

2. Design, production, maintenance and operation of UAS, their engines, propellers, parts, appliances and equipment to control them remotely shall comply with this Regulation.
3. Out of scope of this Regulation are the State aircraft mentioned in Article 3 of the Chicago Convention and indoor operations.

## **Article 2 Definitions**

1. For the purposes of this Regulation, the definitions of Article **NN** of the Civil Aviation Law shall apply.
2. For the purposes of this Regulation, the following definitions shall also apply:
  - a) 'Acceptable Means of Compliance' (AMC) means non-binding standards adopted by an NAA, to illustrate means to establish compliance with Civil Aviation Law and its implementing acts. If AMC have not been promulgated by an NAA, an alternative AMC adopted by JARUS or guidance developed by industry and accepted by NAA may be used;
  - b) 'Aeronautical Information Publication' (AIP) means a publication issued by an authorised AIS Provider containing aeronautical information of a lasting character essential to air navigation;
  - c) 'Automatic Operation' means a phase of flight following pre-programmed instructions that the UA executes while pilot intervention remains possible at all times, under normal conditions;
  - d) 'Autonomous Operation' means a phase of a UA flight, during which a remotely-piloted aircraft is operating, by design and under normal conditions, without possibility of immediate pilot intervention in the control of the flight;
  - e) 'Beyond Visual Line Of Sight' (BVLOS) means a type of UA operation in which the remote crew, including the remote pilot and possible observers, is unable to maintain continuous unobstructed and unaided visual contact with the UA;
  - f) 'Certification Specifications' (CS) means standards adopted by NAA indicating means to show compliance with the Civil Aviation Law and Regulations and which can be used by an organisation for the purpose of certification. If no such applicable standards have been adopted by NAA then Certification Standards adopted by other aviation authorities or JARUS CS or standards developed by industry could apply;

- g) 'Delegated Entity' means a legal or natural person accredited and under continuous assessment by a competent aviation authority, which may conduct certain certification or oversight tasks under this Regulation;
- h) 'Electronic Identification' means the capability to identify a UA in flight without direct physical access to that aircraft;
- i) 'Extended Visual Line Of Sight' (E-VLOS) means a type of operation in which the remote pilot does not maintain continuous unobstructed and unaided visual contact with the UA, however one or more visual observers do, allowing monitoring the flight path of the UA in relation to other aircraft, persons, and obstacles, for the purpose of maintaining separation from them and avoiding collisions;
- j) 'First-Person-View (FPV) mode' means a use of technology (e.g. goggles, display) in the operation of a UA where the remote pilot manoeuvres the UA through a forward looking camera installed on the aircraft, which offers a field of view comparable to a manned aircraft operation pilot sitting in a cockpit;
- k) 'Follow-Me (FM) mode' means an automatic mode of operation of a UAS where the UA constantly follows a person or device at a pre-determined radius;
- l) 'Geo-awareness' means an automatic function which may be used as an advisory tool for supporting the UA to not trespass geographical limitations in the airspace;
- m) 'Geographical Limitation' means a restricted airspace volume defined through electronic map data;
- n) 'Hazard' means a condition or an object with the potential to cause injuries, damage, loss of material or a reduction of the ability to perform a prescribed function;
- o) 'Indoor Operation' means an UA operation in which the hazard of the UA flying away is minimised by walls, ceiling, net or other physical limitation of the volume;
- p) 'Limited UA zones' means restricted airspace volumes where civil UAS operations are allowed under specific conditions;
- q) 'Manufacturer' means any natural or legal person who manufactures a product or has a product designed or manufactured under his name or trademark;
- r) 'Model Aircraft' means an UA that is capable of sustained flight in the atmosphere and that is used for recreational flights;

- s) 'Model Aircraft Club or Association' means an organisation legally established in a Member State for the purpose of conducting leisure flights, air displays, sport or competition activities with UAS;
- t) 'National Aviation Authority' (NAA) means any authority designated by a State or group of States and competent for rulemaking and/or oversight tasks;
- u) 'UAS Operator' means any natural or legal person who operates or intends to operate a UAS for recreational or other than recreational purposes, including commercial purposes;
- v) 'Part-UAS' means the rules applicable to the operation of a UAS falling into Category A and B, as laid down in Annex II to this Regulation;
- w) 'Remote Pilot' (RP) is a natural person who manipulates the flight controls of a UAS, as appropriate, during a flight;
- x) 'Remote Pilot In Command' (RPIC) means the remote pilot designated by the Operator, or owner piloting their own UA, as being in command and charged with the safe conduct of a flight;
- y) 'Remote Pilot Station' (RPS) means a component of the UAS containing the equipment used to pilot the UA;
- z) 'Remotely Piloted Aircraft' (RPA) means a UA, under normal operation, managed by a pilot who is not on-board;
- aa) 'Remotely Piloted Aircraft System' (RPAS) means an RPA, the associated RPS, the command control link between the two and any additional equipment, apparatus, appurtenance, software or accessory that is necessary for the safe operation of the RPA;
- bb) 'UAS Operator Certificate' (UOC) means a certificate authorising an Operator to carry out specified UAS operations;
- cc) 'Safety-Critical Service' means a service whose failure or malfunction may result in serious injuries to people or serious incident with other airspace user or damage to property;
- dd) 'Special UA routes' means ATS routes at very low level, accessible to civil UA, subject to mandatory equipment functionality and performance and other conditions in this regulation;
- ee) 'Standard Scenario' means a description of a UAS operation in the Category B, for which mitigation measures have been determined based on a specific operations risk assessment (e.g. SORA) and which is issued by a NAA in its AMC;



- ff) 'Swarm' means two or more UA whose motion is mutually and automatically coordinated, while the remote pilot controls the entire swarm through a single remote pilot station;
- gg) 'Technical Specification' means a non-binding technical standard that prescribes technical requirements to be fulfilled by a product or process;
- hh) 'Toy Aircraft' means a UA designed or intended, whether or not exclusively, for use in play by children under 14 years of age;
- ii) 'Visual Observer' means a natural person who, by visual observation of the UA, assists the remote pilot in safely conducting the flight;
- jj) 'UA System' (UAS) means the UA and any equipment, apparatus, appurtenance, software or accessory that is necessary for the safe operation of the UA;
- kk) 'Unmanned Aircraft' (UA) means an aircraft which is operated with no pilot on board;
- ll) 'Unmanned Free Balloons' means a non-power-driven, unmanned, lighter-than-air aircraft in free flight;
- mm) 'Visual Line Of Sight' (VLOS) means a type of operation in which the remote pilot maintains continuous unobstructed and unaided visual contact with the UA, allowing the remote pilot to monitor the flight path of the UA in relation to other aircraft, persons, and obstacles, for the purpose of maintaining separation from them and avoiding collisions;
- nn) 'Remote Crew' (RC) means the crew under RPIC authority, actively participating and assisting with the safe conduct of flight.

### **Article 3 –Categories of UAS operations**

UA operations shall fall into one of the following three risk-based categories:

1. A ('Open') is a category of UAS operation that, considering the risks involved:
  - a) requires, except when operating in subcategory A1, registration using the method prescribed by the State before the operation takes place;
  - b) does neither require a prior authorisation by NAA before the operation takes place, nor a pilot licence or certificate of airworthiness;
  - c) is carried out with an UA whose maximum take-off mass is less than 25 kg;
  - d) may be subject to technical requirements for the eligible UAS;
  - e) is subject to operational limitations according to this Regulation; and
  - f) is carried out using a remotely piloted UA.
  
2. B ('Specific') is a Category of UAS operation that, considering the risks involved:
  - a) requires registration using the method prescribed by the State before the operation takes place;
  - b) includes remotely piloted or autonomous operations;
  - c) implements the mitigation measures identified through an operational risk assessment;
  - d) requires the Operator to have an authorisation by NAA before the operation takes place, unless the Operator enjoys the privilege of authorizing operations without prior approval by NAA;
  - e) permits for certain standard scenarios involving remotely piloted UA, a declaration by the Operator instead of authorisation.

3. C ('certified') is a category of UA operation other than A or B.

#### **Article 4 – Principles for UAS operations**

1. The UAS Operator shall be responsible for the safety of its operation.
2. The Remote Pilot (RP) shall be responsible for the safe conduct of each individual UA flight.
3. The Operator shall ensure that UA are equipped with a geofencing function, when required by UAS.OPA.60 and UAS.OPA.70 and with all other technical functionalities required by applicable rules.
4. States may designate zones, airspace volumes or areas where UA operations are permitted, prohibited or restricted, in accordance with Article 12, as well as procedures for UA to access airspace.

#### **Article 5 – Registrations and identification**

1. The UAS Operator shall register the UA in the manner established by the NAA and identify all the UA it operates, as required by UAS.OPA.30 in Category A and by UAS.OPB.20 in category B.
2. The UAS Operator shall ensure UA are equipped with electronic identification means, when required by UAS.OPA.60 or UAS.OPA.70 in Category A and UAS.OPB.20 in Category B.

#### **Article 6 – UAS operations in Category A**

1. Category A includes remotely piloted unmanned aircraft (UA), of less than 25 kg maximum take-off mass (MTOM), subject to proportionate operational limitations and requirements, as detailed in Subpart A of Annex II to this Regulation.
2. Operations in category A may be executed by a model aircraft, by a toy aircraft or in general by UAS used for civil commercial or non-commercial purposes.
3. Considering the different levels of risk within category A operation, States may wish to further divide this category into subcategories of operations. Each subcategory of operation may be characterised by:
  - a) the use of UA defined by the technical requirements provided Appendix II.1 to Annex II for the A1 subcategory and technical limitations in the other subcategories;
  - b) operational limitations; and

- c) requirements for the remote pilot and Operator, as appropriate.
4. NAAs shall ensure that easily understandable information is provided to consumer through an awareness leaflet accompanying any UAS, or equivalent electronic means, as detailed in Appendix II.2;
5. An operation of a UA conducted in the A category within the [State] airspace shall comply with the requirements of Subpart A of Annex II to this Regulation.
6. Installation and use of image and/or video capturing devices and of any other sensor which can potentially be used for collecting data or information, are subject to applicable security, privacy and data protection legislation, whether the UA operation is private, recreational, commercial or non-commercial aerial work.
7. Autonomous operations, dropping of objects, spraying of products, transport of dangerous goods and commercial air transport are prohibited in category A operations, unless under conditions prescribed by the NAA.

#### **Article 7 – UA operations in Category B**

1. The Operator shall implement the mitigation measures identified through an operational risk assessment procedure acceptable to the NAA.
2. The mitigation measures may be contained in a standard scenario published or accepted by the NAA.
3. Model aircraft and toy aircraft operations conducted in the framework of clubs or associations shall comply with article 8.
4. In order to be able to operate in Category B, the Operator, without prejudice to Articles 5 and 12, shall comply with the conditions specified in:
  - a) an operational authorisation issued by the NAA or a delegated entity; or
  - b) a standard scenario; or
  - c) an operational authorisation issued by the holder of a UAS Operator Certificate (UOC) with privileges to authorise such operation.
5. An operation of an UA conducted in Category B within the [State] airspace shall comply with the requirements of Subpart B of Annex II to this Regulation.

#### **Article 8 – Operations conducted in the framework of model clubs and associations**

For UAS operations conducted in the framework of model clubs or associations, the following

applies:

1. the NAA may issue an organisational authorisation to a model club or association without further demonstration of compliance by the UAS Operator, based on the model club's or association's established procedures, organisational structure, and management system; and
2. operational authorisations granted under this Article shall include the conditions and limitations of, as well as the deviations from, the requirements of Annex II to this Regulation.

#### **Article 9 –Other UA operations**

[reserved]

#### **Article 10 – Safety-critical services for Categories A and B**

1. The provider of any safety-critical services is responsible for the accuracy and integrity of the provided information and data, and for the quality of the services.
2. Services may include but are not limited to:
  - a) establishing and maintaining a registry of UAS and UAS Operators;
  - b) maintenance of UAS;
  - c) providing geographical data and limitations;
  - d) the training of Remote Pilots (RP) and essential personnel;
  - e) communication services supporting command and control data link;
  - f) provisions of services through remote pilot stations located anywhere in the world;
  - g) Air Navigation Services (ANS).
3. The service provider shall have a suitable organisational structure, appropriate documented procedures, and adequate resources and personnel.
4. The service provider shall either be under oversight by the NAA or under oversight through the Operator's safety management system.

## **Article 11 – Means of compliance**

1. Acceptable means of compliance (AMC) and certification specifications (CSs) published by NAA or, when acceptable to the NAA, published by JARUS, other aviation authorities or standard making bodies may be used to establish compliance with the Civil Aviation Law and this Regulation. When AMC or CS are complied with, the related requirements of this Regulation are presumed to be met.
2. Alternative means of compliance or technical specifications may be proposed by the applicant to establish compliance with the Civil Aviation Law and this Regulation.
3. The NAA shall establish a system to evaluate all proposed means of compliance or specifications used by itself, or proposed by organisations and persons under its oversight allow the establishment of compliance with the Civil Aviation Law and this Regulation.
4. The NAA shall evaluate all proposed means of compliance or specifications, analysing the documentation provided and, if considered necessary, conducting an inspection of the proponent organisation.
5. When the NAA finds that the proposed means of compliance are in accordance with the Civil Aviation Law and this Regulation, it shall, without undue delay:
  - I. notify the proponent that the means of compliance may be implemented and, if applicable, amend the operational authorisation or certificate of the applicant accordingly;
  - II. inform interested stakeholders about the means of compliance that were accepted.
6. When the NAA itself uses acceptable means of compliance or certification specifications to achieve compliance with the Civil Aviation Law and this Regulation, it shall make them available through electronic means, to all organisations and persons under its oversight.

## Article 12 – Access to airspace

1. Based on the categories of operation [State] may identify airspace areas or special zones:
  - a) Where UAS operations are allowed;
  - b) where UAS operations are not allowed without prior permit by the Air Traffic Service Provider or Organisation (ATSP/O) in coordination with other authorities, or are not permitted at all;
  - c) where UAS shall comply with defined technical or performance specifications, including mandatory equipment or functions; and
  - d) where operations of model aircraft under oversight by respective associations or clubs, or operations of other UAS are permitted.
2. The information on prohibited, restricted, danger and special zones for UAS operations and for operations of clubs or associations for model aircraft, as well as on required ATSP/O permits and related procedures shall be made available by the NAA, by other State entity or by a service provider accepted by the State for this purpose.
3. Special Zones for UA operations below 400 ft (120 m) above surface level include special UA routes, UA test ranges or zones for activity by model clubs or associations.
4. Temporary prohibited, restricted or special zones for UA operations may be established by the State and disseminated to UAS Operators and Remote Pilots through means ensuring appropriate timeliness, through providers of geographical data and limitations, including areas affected by public emergencies or accidents.
5. ATSP permit is not required for operations in subcategory A1;
6. The UAS Operator is responsible to comply with the information provided according to paragraphs 1 to 5, with the Rules of the Air, with the Airspace Classification, and with Air Traffic Management rules and procedures.

### **Article 13 – Operations of foreign UAS in the [State]**

1. Any person may operate an UAS in Category A in the airspace of [State], subject to the rules and limitations contained in this Regulation.
2. The NAA, according to paragraph 3.2.2 of the first edition of ICAO Doc 10019, may agree upon procedures to allow cross-border flights in UAS Category B, through bilateral or multilateral agreements with aviation authorities of other ICAO contracting States.

### **Article 14 – Immediate reaction to a safety problem**

1. The NAA shall collect, analyse and disseminate safety information concerning UAS Operations in their competence in accordance with the Civil Aviation Law and this Regulation.
2. Upon receiving the information referred to in paragraph 1 above, the NAA shall take adequate measures to address safety problems.
3. Measures taken in paragraph 2 above shall immediately be notified to all persons or organisations which need to comply with such measures under Civil Aviation Law and this Regulation.
- 4.
5. NAA shall also notify those measures to the other concerned ICAO Contracting States, when combined action is required.

### **Article 15 – Applicability**

As from [*to be defined by State or regional authority*], all UAS in Category A and B shall be operated in accordance with this Regulation.

### **Article 16 – Entry into force and application**

This Regulation shall enter into force on [*date to be defined by State*].

It shall apply from the dates established in Article 15.

This Regulation shall be binding in its entirety and directly applicable by [TBD by State].

Done at PLACE, dd/mm/yyyy

Signed by.....



## 1.3 ANNEX I - Categorisation of UAS operations

1. States wishing to establish subcategories A1, A2 or A3, shall consider the following characteristics:

UAS sub-category	UAS MTOM	Distance from people	Maximum height of the operation	Remote-pilot competence	Age of the remote pilot	Electronic identification/geofencing	Technical requirements
<b>A1 Fly over people</b> <i>Note (a)</i>	Not more than 250 g	Not directly above crowds	Not specified providing that the operation remains VLOS	None beyond availability of information from manufacturer	No requirement	Not mandatory	Yes <i>Note (b)</i>
<b>A2 Fly close to people</b> <i>Note (a)</i>	250 g to 4 kg <i>Note (b)</i>	Not directly above people	See UAS.OPA.60	Online training and testing of theoretical knowledge <i>Note (c)</i>	See UAS.OPA.60	Yes	No <i>Note (b)</i>
<b>A3 Fly far from people</b> <i>Note (a)</i>	250 g to 25 kg	Not endangering people not involved in the operation and at a safe distance from the boundaries of congested areas	See UAS.OPA.70	Online training and testing of theoretical knowledge <i>Note (c)</i>	See UAS.OPA.70		

**Table 1: Subcategories of operation**

### NOTES:

(a) It applies to any UAS Operation, from recreational private model aircraft to commercial UAS aerial work.

(b) Following the example of US Code of Federal Regulations (CFR) 14, Part 107 which does not address the safety of the UAS as a product for operations that are not conducted directly over people, technical requirements are only applicable in A1, to confirm that a UAS can be operated safely directly over people. See Appendix II.1 for such technical requirements. Emergency recovery systems may be excluded in A1. Conversely no technical requirements are proposed for A2 and A3, which does not exclude that States may establish rules for putting such products on the consumer market.

(c) Online training approved by NAA or delegated entity: theoretical remote-pilot competence is an essential element to ensure safety in subcategories A2 and A3.

2. if all the above conditions are not met, the operation is either Category B or C, or in the frame of a model club or association.

## **1.4 ANNEX II - Part UAS- Operation of UAS in the A and B categories**

### SUBPART A

#### **CATEGORY A**

##### **UAS.OPA.10 Subcategories of operations**

1. When States elect to introduce subcategories, operation of UAS in Category A shall fall into one of the following subcategories, based on the potential level of risk that shall be mitigated to an acceptable level:
  - a) subcategory A1: operation of UA posing a negligible risk of serious injury to people on the ground or damage to manned aircraft, and requiring neither specific remote pilot competence nor age limitations;
  - b) subcategory A2: operation of UA with an increased risk that requires compliance with requirements ensuring that they pose an acceptable risk of serious injury to people on the ground or damage to manned aircraft, when operated according to this Regulation;
  - c) subcategory A3: operation of UA with an even higher risk that requires compliance with additional requirements ensuring that they pose an acceptable risk of serious injuries to people on the ground or damage to manned aircraft and operated by registered Operators.
2. Classification in the subcategories shall be based on Annex I.

## **UAS.OPA.20 Responsibilities of the Operator**

The UAS Operator shall:

1. comply with the regulations applicable in [State] of the operation, in particular those related to safety, privacy, data protection, liability, insurance, security and environmental protection;
2. ensure that personnel involved in the operation and maintenance are available in sufficient quantity, managed, adequately trained and checked to verify that competence is maintained;
3. use an UAS only in the Category or sub-category of operations for which the aircraft is eligible; and
4. establish procedures to ensure that operations are carried out in a safe manner so as not to endanger life or property of others.

## **UAS.OPA.30 Registration of UA**

Except when operating in subcategory A1 or when already registered in Category B, the UAS Operator shall:

1. register UA using the method prescribed by the NAA;
2. in the case of a legal person, include in the registration form the name of the accountable manager and the address; and
3. ensure that the UA has an identification means as prescribed by the NAA.

## **UAS.OPA.40 Requirements applicable to all UA operations in the Category A**

1. No person may manipulate the flight controls of a UAS or act as a remote pilot, visual observer, or direct participant in the operation of the UAS if he or she knows or has reason to know) that he or she has a physical or mental condition that would interfere with the safe operation of the UAS.
2. Where the remote pilot is also the Operator, he or she shall comply with UAS.OPA.20 and UAS.OPA.30.
3. Before the initiation of any UAS operation, the remote pilot shall:
  - a) obtain updated information about any flight restrictions or conditions published by the NAA or made available by a service provider, that may be relevant to the intended operation;
  - b) comply with rules for accessing the airspace and, when applicable, obtain the ATSP permit;
  - c) familiarise themselves with the operating environment, including the locations of people, properties and any other hazards; and
  - d) check that:
    - i. the UAS is in a safe condition to accomplish the intended flight and contains all technical equipment and functionality required by the applicable rules; and
    - ii. the operation will comply with limitation and procedures in the flight manual, user guide or equivalent provided by the manufacturer.
4. During flight, the remote pilot shall:
  - a) comply with the requirements applicable to the UAS operational category and subcategory;
  - b) discontinue a flight when continuing the flight would pose a hazard to other aircraft, people, or properties;
  - c) operate the UA within the performance limitations defined in the flight manual, user guide or equivalent provided by the manufacturer;
  - d) not use the UA to drop objects, spray products, transport dangerous goods or passengers; and
  - e) not fly close to areas where an emergency response effort is ongoing as to interfere with the safety and conduct of that operation.

## **UAS.OPA.50 Requirements applicable to UAS Operations in subcategory A1**

UA operations in subcategory A1 shall:

1. be performed:
  - a) either with a UAS placed on the market:
    - i. complying with the product's requirements defined in Appendix II.1; and
    - ii. not be modified in a way that breaches compliance with the requirements in Appendix II.1; or
  - b) with a privately built UAS with a maximum take-off mass, including payload, of less than 250 g;
2. be conducted:
  - a) up to a ground speed not greater than 19 m/s; and
  - b) within a range such that the remote pilot maintains VLOS and is able to control the UA at all times, or in follow-me mode, only if the remote pilot maintains a safe separation of the UA from people, property, ground vehicles and from other airspace users.

## **UAS.OPA.60 Requirements applicable to UAS operations in subcategory A2**

UA operations in subcategory A2 shall:

1. be performed with a UAS:
  - a) with a maximum take-off mass not greater than 4 kg;
  - b) complying with UAS.OPA.030 for registration and identification; and
  - c) with active and up-to-date geofencing and electronic identification systems;
2. be conducted:
  - a) up to a height of 120 m (400 ft) above ground level unless otherwise limited by the NAA for the operation area;
  - b) within a range such that the remote pilot maintains VLOS; and
  - c) at a safe distance from people, property, ground vehicles and from other airspace users and not over open assemblies of persons;

3. be carried out by a remote pilot:

- a) Having demonstrated sufficient theoretical knowledge by:
  - (i) completing online training; and
  - (ii) passing an online test in a manner and format established by the NAA;
- b) having familiarised with the UAS to be operated;  
and
- c) being at least 16 years old or supervised by a person complying with (a).

### **UAS.OPA.70 Requirements applicable to UAS Operations in subcategory A3**

UAS operations in subcategory A3 shall:

1. be performed with:

- a) a UA having an MTOM, including payload, of less than 25 kg either privately built UA, or placed on the market; and
- b) complying with UAS.OPA.030 for registration and identification; and
- c) with active and up-to-date geofencing and electronic identification systems.

2. be conducted:

- a) up to a height of 120 m (400 ft) above ground level, unless otherwise determined by the NAA for the operational area based on airspace considerations;
- b) within a range such that the remote pilot, or a visual observer who is situated within the VLOS of the remote pilot, maintains VLOS;
- c) in case of (b) clear and effective communication shall be established between the remote pilot and the visual observers;
- d) in an area where the remote pilot can reasonably expect that non-active participants will not be endangered within the range in which the UA will be operated; and
- e) above sparsely populated areas at a safe distance from the boundaries of congested areas; and

3. be carried out by a Remote Pilot:
  - a) Having demonstrated sufficient theoretical knowledge by completing training and passing a test in a manner and format established by the NAA;
  - b) Having demonstrated sufficient theoretical knowledge and practical skill to coordinate with one or more observers, when applicable; and
  - c) being at least 16 years old or supervised by a person complying with (a) and (b).

#### **UAS.OPA.80 Occurrence reporting**

1. In the event of fatal or serious injury to a person, or when another aircraft other than the UA is involved, the UAS Operator shall report the occurrence and other safety-related information, in compliance with [applicable Regulation on occurrence reporting].
2. The NAA shall establish a system for voluntary reporting of any other safety occurrences, in addition to those in 1.

# APPENDICES TO PART UAS

## Appendix II.1 - Technical requirements for operations in subcategory A1 UAS

A UAS eligible for operations in subcategory A1, shall:

1. have a maximum take-off mass, including payload, of no more than 250 g;
2. have maximum ground speed limited to less than 68 km/h (19 m/s);
3. no unsafe design characteristics exist (e.g. unprotected high-speed rotating parts, etc.);
4. be safely controllable;
5. the UAS shall not be powered by electricity of a nominal voltage exceeding 24 volts direct current (DC) or the equivalent alternating current (AC) voltage, and its accessible parts shall not exceed 24 volts DC or the equivalent AC voltage;
6. be placed on the market with clear operational instructions and warnings highlighting the risks related to UAS Operations, adapted to the age of the user; and
7. include information required to use the UAS in accordance with the applicable regulations on aviation safety, security, privacy and data protection, liability and insurance and the awareness leaflet, or equivalent electronic means, defined in Appendix II.2.



## Appendix II.2 - Awareness leaflet

1. States shall ensure that each UAS placed on the market is accompanied by an ‘awareness leaflet’, or equivalent electronic means, to raise the attention of the consumer about the risks related to UAS Operations and provide information about the applicable legislation on aviation safety, security, privacy and data protection, liability and insurance.
2. The leaflet, or equivalent electronic means, shall include reference to a website, not managed by the economic Operators, providing additional information.
3. As a minimum the leaflet, or equivalent electronic means, shall summarise, in a form understandable by consumers, the information referred in the table below:

Mandatory minimum information to be included in the leaflet per A subcategories		
A1	A2	A3
Same aviation safety rules applicable to any operation in Category A: private, recreational, toy, model, aerial work, commercial or non-commercial		
Image and/or video capturing devices permitted, if not infringing privacy and data protection and subject to applicable legislation on security		
Dropping of objects, spraying of products, transport of dangerous goods and commercial air transport prohibited		
Art. 12 for access to airspace and contact ATSP		
	Registration (ref. UAS.OPA.30)	
Responsibilities of remote pilot (ref.UAS.OPA.20)		
Occurrence reporting (ref. UAS.OPA.80) and contact		
	Liability and insurance	
Limitations (ref. <sup>1</sup> UAS.OPA.050 (b))	Limitations (ref. UAS.OPA.060 (b))	Limitations (ref. UAS.OPA.070 (b))
	Minimum age 16 years	
	Pilot competence (ref. UAS.OPA.60 (3) and UAS.OPA.70 (3))	

<sup>1</sup> The number and text of the rule does not need to be printed on the leaflet.

## **SUBPART B**

### **CATEGORY B**

#### **UAS.OPB.10 Responsibilities of the Operator**

- (a) The Operator shall be responsible for remotely piloted or autonomous operation.
- (b) The UAS Operator shall designate a remote pilot and/or crew for each remotely piloted operation or a competent person responsible for each autonomous operation.
- (c) The Operator shall:
  - I. comply with the regulations applicable in the State affected by the operation, in particular those related to safety, privacy, data protection, liability, insurance, security and environmental protection;
  - II. ensure that prior to conducting operations, Remote Pilots and all other personnel are competent for the performance of their task and are familiar with the Operator's manual, policies and procedures;
  - III. comply with the 'standard scenarios' requirements when applicable;
  - IV. carry out an operation within the limitations and conditions specified in the operational authorisation or operational declaration.

#### **UAS.OPB.20 Registration and Identification of UA**

The UAS Operator shall:

- (a) Unless when already registered in the Category A , register the UA with the NAA using the process established by the NAA, which includes the responsible Operator and, if different, of the owner; and
- (b) Have a means of identification on the UA, including at least a means of visual identification on the airframe containing the identification of the UA and of the Operator;
- (c) Retain attestation of such registration;
- (d) Update the registration at the end of the operational life of the UA or when the Operator or owner changes or after a significant change to the UAS.

#### **UAS.OPB.30 Requirements applicable to all UAS operations in the Category B**

Before undertaking operations in Category B the Operator shall ensure that:

- (a) All operated UAs are registered according to UAS.OPB.20;
- (b) The UAS shall be in condition for safe flight;

- (c) All operated UAS types are accompanied by a flight manual issued by the manufacturer, or equivalent information in case of a privately built UAS;
- (d) Procedures are implemented for the maintenance of the UAS, including management of the all systems essential for the safe operation of the UAS;
- (e) All mitigation measures identified through the operational risk assessment in the UAS.OPB.80 are implemented and properly documented.

#### **UAS.OPB.40 Requirements applicable to Remote Pilots in the Category B**

2. In addition to UAS.OPB.30, in case of remotely piloted operations the remote pilot shall:
  - (a) Be in a physical and mental condition that would not put at risk the safe operation of the UA, people, wildlife, public and private property, and from other airspace users.
  - (b) Where the remote pilot is also the Operator, comply with UAS.OPB.10 and UAS.OPB.20.
  
3. Prior to and during UAS operation(s), the remote pilot shall adhere to the conditions, limitations and operational criteria of the safe conduct of flight by:
  - (a) obtaining updated information about any flight restrictions or conditions published by the NAA or by a provider of geographical information, that may be relevant to the intended operation;
  - (b) complying with rules for accessing the airspace and, when applicable, obtain the ATSP permit;
  - (c) inspecting the operating environment, including the locations of people, properties and any other hazards;
  - (d) ensure that the UAS is in a safe condition to conduct flight, and where applicable, is updated with geo-awareness data;
  - (e) checking the launching and recovery procedures are safe and adequate for the intended operation;
  - (f) knowing and applying the operations manual for the intended operation; and
  - (g) ensuring that the operating conditions, including environmental conditions, are compatible with the authorised conditions and limitations.
  
4. During flight, the remote pilot shall:
  - (a) ensure safe operation with the UAS;
  - (b) comply with the conditions and limitations defined by the NAA for the area or airspace, including possible restrictions for areas where an emergency response effort is ongoing;
  - (c) ensure safe separation of the UA from people, wildlife, public and private property, and from other airspace users;
  - (d) discontinue flight if continuing would pose a hazard to other UA, people, wildlife, public and private property, and from other airspace users;

- (e) operate the UA within the performance limitations defined in the flight manual provided by the manufacturer; or equivalent manual for a privately built UAS;
- (f) not use the UA to transport persons;
- (g) operate the UA in a considerate manner minimising impact of nuisance noise emissions.

#### **UAS.OPB.50 Requirements applicable to autonomous operations in Category B**

- 5. In addition to UAS.OPB.30, in case of autonomous operations, the Operator shall ensure that during all phases of the operation, responsibilities and tasks are properly allocated in accordance with the procedures established according to paragraph UAS.OPB.10 (c).
- 6. In particular the Operator shall comply with the obligations stated in UAS.OPB.40 (2).
- 7. Deliver a proper handover to the next responsible person in the following duty period, if applicable.
- 8. Not use the autonomous operations to transport persons.

#### **UAS.OPB.60 Operational Declaration**

- (a) Except when holding a UOC per Subpart C of this Annex, with the appropriate privileges, and where the relevant 'standard scenario' accepted by the NAA so requires, the Operator shall submit an operational declaration, including all the information required in the form and manner established by the NAA.
- (b) Upon acknowledgement of receipt of the operational declaration, the Operator shall be entitled to start the operation as long as it corresponds to a 'standard scenario' accepted by the NAA.
- (c) The Operator shall notify the NAA or delegated entity, without delay, of any changes to the statements and information submitted in the operational declaration.

#### **UAS.OPB.70 Application for an operational authorisation**

- (a) Except when holding an UOC, with the appropriate privileges, the Operator shall submit an application for operational authorisation to the competent authority, according to UAS.OPB.100 in accordance with the form made available by the NAA prior to starting an operation that:
  - I. corresponds to a 'standard scenario' requiring an operational authorisation; or
  - II. does not correspond to a 'standard scenario'.
- (b) The application for an operational authorisation shall include all the information required and be in a form and manner established by the NAA.
- (c) The Operator shall only start the proposed operation after having received the operational authorisation issued by the NAA.

- (d) Any change to the operation not covered by the authorisation shall require a new application.

#### **UAS.OPB.80 Operational Risk Assessment**

- (a) If the operation does not correspond to any of the 'standard scenarios' as per UAS.OPB.60, the Operator shall submit an operational risk assessment with a sufficient level of robustness, in order to limit the risk to an acceptable level.
- (b) For the operational risk assessment in (a) the Operator may refer to 'standard scenarios' published by other NAAs or standard making bodies.

#### **UAS.OPB.90 Operations Manual**

- (a) An operation manual may be required by the outcome of the risk assessment.
- (b) The operations manual shall include a statement that the UAS will be operated only by listed Remote Pilots and other relevant personnel with a level of competency appropriate for conducting operations with that UAS and appropriate to the category of UAS operation.
- (c) The operations manual shall include the organization structure if existing.

#### **UAS.OPB.100 Issuing of an Operational Authorisation**

- (a) An operational authorisation may be issued for either a limited or an unlimited duration or for a limited number of flights.
- (b) The conditions under which an Operator is authorised to conduct the intended operation shall be specified in the authorisation.
- (c) If there are changes to the operational conditions for which an Operator has received an operational authorisation, and a new application has not been submitted according to UAS.OPB.070, the NAA may decide whether the authorisation shall be suspended, revoked or amended.

#### **UAS.OPB.110 UAS Logbook**

The Operator shall ensure that, as a minimum, records of duration of flight and maintenance performed with regard to the UAS are retained in the form of a logbook or equivalent, as established by the NAA.

### **UAS.OPB.120 Certified UAS and the use of Certified Equipment**

- (a) UAS accompanied by a valid certificate of Airworthiness maybe used for operations in Category B. In this case the requirements of the Category C requirements for initial and continuing airworthiness apply.
- (b) Certified equipment may be used in UAS for operations in Category B.
- (c) The Operator shall ensure continuing airworthiness of the certified equipment according to the instructions delivered by the holder of the equipment type certificate and comply with mandatory directives published by the NAA of the State of Design [in accordance with]

### **UAS.OPB.130 Occurrence Reporting**

The Operator shall report in a manner established by the NAA any occurrence of the UA which results in a serious incident or accident.