

## Part 27

### Unmanned & Remotely Piloted Aircraft

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## SUBPART A: GENERAL

### 27.001 APPLICABILITY

- (a) This Part prescribes the requirements of Rwanda regarding the operations or piloting of unmanned and remotely piloted aircraft of any size, whether generically termed as aircraft, balloons, drones, vehicles or models.
- (b) This Part is applicable to all persons operating unmanned and/or remotely piloted aircraft of any size in the airspace of Rwanda over land or water.
- (c) This Part is specifically applicable to the following—
  - (1) Remotely piloted aircraft systems;
  - (2) Unmanned aircraft systems;
  - (3) Unmanned aerial vehicles;
  - (4) Drones;
  - (5) Unmanned balloons, whether tethered or free-flight;
  - (6) Radio controlled model aircraft;
  - (7) Free flight model aircraft (whether launched by hand, catapult or rocket cartridge);
  - (8) Control line model aircraft;
  - (9) Model rockets;
  - (10) Kites;
  - (11) Small free flight toys; and
  - (12) Any other unmanned or remotely piloted aircraft that is not yet identified in this Section.

### 27.005 DEFINITIONS

- (a) The following definitions are used in this Part—

*Note: Additional definitions are provided in Part 1, Appendix 1 to 1.007.*

**Aerodrome.** An aerodrome that is promulgated in the AIP.

**Controlled aerodrome.** An aerodrome at which air traffic control service is provided to aerodrome traffic.

**Control line model aircraft.** A model aircraft primarily controlled in flight by a single or multiple wire system operated by the person flying the aircraft and restricted to circular flight about a central point.

**Free Balloon.** A pilotless aerostat without propulsion in free flight, having a gas capacity greater than 1.5 m<sup>3</sup>.

**Free flight model aircraft.** A model aircraft with a maximum wing loading of 62 g/dm<sup>2</sup> (20 oz/ft<sup>2</sup>), with a flight path that, once launched, is uncontrollable.

**Kite.** A pilotless aerodyne without propulsion that is tethered to a fixed point, or is hand held, and is sustained by the wind.

**Large model rocket.** A rocket that—

- (i) Uses more than 25 g but not more than 125 g of propellant; and
- (ii) Produces more than 20 but not more than 320 Newton seconds of total impulse; and
- (iii) Uses a slow-burning propellant; and
- (iv) Is made of lightweight materials such as paper, wood, rubber and plastic; and
- (v) Does not have the nose cone, fins, or body fabricated from metal; and
- (vi) Has a gross mass, including the propellant of more than 453 g but not more than 1.5 kg.

**Moored balloon.** A pilotless balloon that is moored to the surface of the earth, or to an object on the surface of the earth, and has a maximum diameter of more than 1.5 m or a gas capacity of more than 3 m<sup>3</sup>.

**Remotely piloted aircraft (RPA).** An unmanned aircraft that is piloted from a remote station and—

- (i) Includes a radio controlled model aircraft, but
- (ii) Does not include a control line model aircraft or a free flight model aircraft.

**Remotely piloted aircraft system.** A remotely piloted aircraft, each of its associated remote pilot stations and the command and control links required to operate the system.

**Remote pilot station.** The component of a remotely piloted aircraft system comprising the equipment used to pilot the aircraft.

**Rocket.** A pilotless vehicle propelled by a system that contains every ingredient needed to form its own jet other than—

- (i) An aerial firework; or
- (ii) A rocket propelled by a model rocket motor of size A-D which achieves no more than 20 Newton-seconds of total impulse.

**Shielded operation** An operation within 100 m of a structure and below the top of the structure.

**Unmanned aircraft.** An aircraft designed to operate with no pilot on board and includes unmanned balloons, kites, control line model aircraft, free flight model aircraft and remotely piloted aircraft.

**Unmanned aircraft system (UAS).** An aircraft and its associated elements which are operated with no pilot on board.

### **27.010 ABBREVIATIONS**

- (a) The following acronyms and abbreviations are used in this Part—

*Note: Additional acronyms are provided in Part 1, Appendix 1 to 1.008.*

RPA = Remotely Piloted Aircraft

UAS = Unmanned Aircraft Systems

### **27.015 PENALTIES FOR NON-COMPLIANCE**

- (a) Failure to comply with the applicable requirements of this Part when operating an unmanned and/or remotely piloted aircraft may result in—
- (1) A request from the civil authorities to suspend flight operations pending an investigation;
  - (2) The requirement to comply with more stringent requirements in the interest of public safety; or
  - (3) A period of suspension of privileges to operate these types of aircraft.
- (b) Continuing failure to comply with the applicable requirements of this Part when operating an unmanned and/or remotely piloted aircraft may result in—
- (1) Seizure of the aircraft;
  - (2) Destruction of the aircraft; and/or
  - (3) Revocation of the privileges to operate these aircraft for a period of up to 12 months.

### **27.020 INTERACTION WITH CIVIL AUTHORITIES**

- (a) The operator or pilot of an unmanned or remotely piloted aircraft shall have in their personal possession when operating this aircraft—
- (1) A valid personal identification issued by credible civil authorities;
  - (2) Proof of registration of the aircraft with the Authority;
  - (3) Proof of liability insurance for the aircraft;
  - (4) If required, a valid flight authorisation;
  - (5) If required, a valid airworthiness certificate;
  - (6) If required, a valid pilot license or permit.
- (b) The operator or pilot shall provide these documents without delay to the representatives of the Authority or law enforcement authorities upon request.

- (c) When requested by the civil authorities, the operator or pilot shall cease operations of the aircraft until the basis for the request has been resolved.

## **SUBPART B: OPERATIONS: RECREATIONAL & HOBBY USE**

### **27.030 APPLICABILITY**

- (a) The requirements of this Subpart are applicable to the use of all unmanned and/or remotely piloted aircraft weighing less than 15 kg when used for recreational or hobby activities.
- (b) Unmanned and/or remotely piloted aircraft weighing between 15 kg to 25 kg may be operated under this Subpart for recreational and hobby activities when specifically approved by the Authority for such operations.

### **27.035 NO REMUNERATION, COMPENSATION OR AERIAL WORK**

- (a) The operator or pilot of an aircraft to which this Subpart applies shall not operate the aircraft except for recreational or hobby purposes.
- (b) The operator or pilot shall not request or receive remuneration or any form of compensation from any person or organisation for the operation of the aircraft.
- (c) The operator or pilot shall not use the aircraft for any aerial work purposes.

*Note: If intending any use of the aircraft for remuneration, compensation or in aerial work, refer to Part 11, Subpart L, for specific requirements which provide for such an authorisation.*

### **27.040 CARELESS OR RECKLESS OPERATIONS**

- (a) The operator or pilot of an aircraft to which this Subpart applies shall not operate the aircraft in a careless or reckless manner so as to endanger other persons or their property.
- (b) The operator or pilot of an aircraft to which this Subpart applies shall take all practicable steps to minimize hazards to persons, property and other aircraft that might be caused by these operations.

### **27.045 PRIOR CONSENT TO OVERFLY**

- (a) The operator or pilot of an aircraft to which this Subpart applies shall—
  - (1) Stay clear of airspace above persons who have not given consent to the flight being conducted over them;
  - (2) Avoid operating above property without prior consent from—
    - (i) Any persons occupying that property; or
    - (ii) The property owner.
- (b) The operator or pilot of an aircraft to which this Subpart applies shall not operate over a crowd or congested area of persons even when consent has been obtained from the property owner.

### **27.050 PROXIMITY TO PERSONS**

- (a) The operator or pilot of an aircraft to which this Subpart applies shall maintain, from any person, at least—
  - (1) 50 feet laterally; and
  - (2) 100 feet vertically.
- (b) Paragraph (a) does not apply to persons assisting in the launch or recovery of the aircraft.

### **27.055 VISUAL LINE OF SIGHT OPERATIONS**

- (a) The operator or pilot of an aircraft to which this Subpart applies shall, at all times, maintain an unobstructed visual line of sight view of the aircraft.
- (b) For the purposes of this Section, a visual line of sight means a straight line along which an observer has a clear view and which may be achieved with the use of—

- (1) Normal corrective lenses (contact lenses, corrective glasses, sunglasses); or
  - (2) A first person view system comprising a trained and competent observer who maintains both direct eye contact with the aircraft and communication with the person who is operating the aircraft.
- (c) The operator or pilot of an aircraft to which this Subpart applies shall not operate the aircraft in—
- (1) Any area in which the person's view of the whole operational area may be obstructed; or
  - (2) Meteorological conditions that may obstruct the person's ability to view the aircraft.

### **27.060 VISIBILITY & PROXIMITY TO CLOUDS**

- (a) The operator or pilot of an aircraft to which this Subpart applies shall not operate that aircraft when—
- (1) The visibility is less than 1 statute mile; and
  - (2) The base of the lowest clouds is less than 500 feet from the surface.
- (b) No person may operate an aircraft to which this Subpart applies during conditions of fog.

*Note: Fog indicates that the base of the clouds is on the surface.*

### **27.065 MAXIMUM ALTITUDE**

- (a) The operator or pilot of an aircraft to which this Subpart applies shall not operate that aircraft higher than 400 feet from the surface.
- (b) Operations of unmanned or remotely pilot aircraft above 400 feet from the surface may only be conducted—
- (1) In airspace blocked or designated as a Danger Area for such purposes by the Authority; and
  - (2) Published by NOTAM or in Rwanda Aeronautical Information Publication (AIP).

### **27.070 NIGHT OPERATIONS**

- (a) The operator or pilot of an aircraft to which this Subpart applies shall not operate that aircraft at night
- (b) Paragraph (a) does not apply to operations that are operated—
- (1) Indoors; or
  - (2) A continuous shielded operation.

*Note: The aircraft would be considered to be "shielded" (from manned aircraft) if it conducted below the maximum height of the surrounding structures or vegetation.*

### **27.075 RIGHT OF WAY**

- (a) The operator or pilot of an aircraft to which this Subpart applies shall—
- (1) Maintain a continuous awareness for the presence of manned aircraft; and
  - (2) If possible, cease operations until the manned aircraft is no longer visible.
- (b) The operator or pilot of an aircraft to which this Subpart applies shall give way to, and remain well clear of, all manned aircraft on the ground and in flight.
- (c) The operator or pilot of a powered aircraft to which this Subpart applies shall give way and remain well clear of any other unmanned aircraft.

### **27.080 PROXIMITY TO AERODROME**

- (a) The operator or pilot of an aircraft to which this Subpart applies shall not operate this aircraft within 8 km (5 sm) of an aerodrome.
- (b) Paragraph (a) does not apply in proximity to a controlled aerodrome if the operator or pilot has received clearance or authorisation from air traffic control for the specific flight or series of flight.
- (c) Paragraph (a) does not apply in proximity to an uncontrolled aerodrome if the operator of the aircraft to which this Subpart applies has—

- (1) Received a written authorisation from the aerodrome operator specifying the terms of use; and
- (2) Ensured that a NOTAM detailing the operational activities, location relative to the runways and maximum altitudes has been issued by the aerodrome operator.

**27.085 DROPPING OF ARTICLES**

- (a) The operator or pilot of an aircraft to which this Subpart applies shall not drop an article from this aircraft unless specifically authorised by an authorised representative of the Authority.

**27.090 CONTROLLED & SPECIAL USE AIRSPACE**

- (a) The operator or pilot of an aircraft to which this Subpart applies shall not operate that aircraft into the following airspace—
  - (1) Controlled airspace (Classes A, B, C, D, E, and F)
  - (2) Danger areas (except for an area specifically designated for unmanned aircraft usage);
  - (3) Prohibited areas;
  - (4) Restricted areas; and
  - (5) Wildlife protection areas.

*Note 1: Compliance with the restrictions to maximum altitude and proximity to aerodromes will ensure that the operator is in compliance with Section 27.090(a)(1).*

*Note 2: The operator should obtain an aeronautical chart for the intended location of the flight and review it for compliance with Section 27.090(a)(2)(3)(4)(5).*

**27.095 KNOWLEDGE OF AIRSPACE DESIGNATIONS**

- (a) The operator or pilot of an aircraft to which this Subpart applies shall not operate this aircraft unless—
  - (1) Before each flight the person is aware of—
    - (i) The surrounding airspace designations; and
    - (ii) Any applicable airspace restrictions in place in the area of intended operation; or
  - (2) The operation is conducted under the direct supervision of a person who is aware of—
    - (i) The airspace designations; and
    - (ii) Any applicable airspace restrictions in place in the area of intended operation."

**SUBPART C: CERTIFICATES & LICENSES****27.100 APPLICABILITY**

- (a) This Subpart is applicable to remotely piloted aircraft that are—
  - (1) Controlled by radio, wireless signal or satellite; and
  - (2) Using visual line of sight, internal camera or digital interface; and
  - (3) Other aircraft when the operator or pilot has a history of non-conformance with the Subpart B.

**27.105 REGISTRATION OF THESE AIRCRAFT**

- (a) No person may operate a unmanned and/or remotely piloted aircraft unless, prior to flight in Rwanda—
  - (1) Its ownership has been registered with the Authority;
  - (2) If a mass of more than 15 kg, it displays the assigned registration marks in the manner prescribed by the Authority; and
  - (3) The evidence of that registration is in operator or pilot's personal possession at the time of flight.

**27.110 LIABILITY INSURANCE**

- (a) No person may operate or pilot an unmanned and/or remotely piloted aircraft unless the operator and/or pilot has—

- (1) Current third-party liability insurance of claim levels acceptable to the Authority for the level of risk; and
  - (2) Has evidence of that insurance in his personal possession at the time of flight.
- (b) Paragraph (a) will not apply to an unmanned and/or remotely piloted aircraft weighing less than 15 kg unless the operator or pilot has an incident involving failure to maintain compliance with Subpart B of this Part.

#### **27.115 CERTIFICATION OF AIRWORTHINESS**

- (a) No person may operate a unmanned and/or remotely piloted aircraft unless, prior to flight in Rwanda—
- (1) It has been issued an airworthiness certification by an authorised person or organisation; or
  - (2) It has been issued a Certificate of Airworthiness by the Authority.
- (b) Paragraph (a) will not apply to an unmanned and/or remotely piloted aircraft weighing less than 15 kg unless the operator or pilot has an incident involving failure to maintain compliance with Subpart B of this Part.

#### **27.120 PILOT LICENSING AND/OR PERMITTING**

- (a) No person shall operate or pilot an unmanned and/or remotely piloted aircraft unless he/she has—
- (1) Satisfactorily completed a knowledge test of civil aviation regulations applicable to the proposed operations;
  - (2) Satisfactorily completed the skill test prescribed by the Authority;
  - (3) Been issued a license or permit authorising the pilot privileges being exercised; and
  - (4) Has that licence or permit granted by the Authority in his/her personal possession prior to, during and after the flight.
- (b) Paragraph (a) will not apply to an unmanned and/or remotely piloted aircraft weighing less than 15 kg unless the operator or pilot is involved in an incident failing to maintain compliance with Subpart B of this Part.

#### **27.125 APPROVED PERSON OR ORGANISATION**

- (a) The Authority may approve specific persons or organisations to perform specified functions to support the operations of unmanned and remotely aircraft.
- (b) An approved person or organisation means a person or organisation having appropriate expertise in the design, construction or operation of remotely piloted aircraft, or appropriate knowledge of airspace designations and restrictions, and who has been approved by the Director to perform one or more of the following specified functions—
- (1) Issuing a pilot qualification for operating remotely piloted aircraft; or
  - (2) Appointing persons to give instruction to operators of remotely piloted aircraft; or
  - (3) Authorising a person to give the Rwanda NOTAM Office notification of remotely piloted aircraft operations; or
  - (4) Authorising the construction or modification of remotely piloted aircraft greater than 15kg; or
  - (5) Inspecting and approving the construction of a remotely piloted aircraft greater than 15kg; or
  - (6) Authorising the operation of a remotely piloted aircraft greater than 15kg.
- (c) A person authorised by an approved person or organisation and, with the approval of the nearest Authority air traffic unit and nearest aerodrome operator, may establish a temporary Danger Area by providing the following information to the Rwanda NOTAM Office—
- (1) The name, address, and telephone number of the aircraft operator;
  - (2) The location of the proposed operation;
  - (3) The date and time and duration of the proposed operation; and



- (4) The maximum height AGL proposed for the aircraft operation.

## **SUBPART D: REMOTELY PILOTED AIRCRAFT SYSTEMS**

### **27.140 APPLICABILITY**

- (a) This Subpart is applicable to remotely piloted aircraft systems that are capable of safe operations in controlled airspace with manned aircraft.

### *Subdivision I: General Operating Rules*

#### **27.145 AUTHORISATION REQUIRED**

- (a) No person may operate a remotely piloted aircraft system (RPAS) engaged in domestic or international air navigation in Rwanda airspace without appropriate authorisation from the State from which the take-off of the remotely piloted aircraft (RPA) is made.
- (b) No person may operate an RPA across the territory of another State without special authorisation issued by each State in which the flight is to operate. This authorisation may be in the form of agreements between the States involved.

#### **27.150 PRIOR COORDINATION REQUIRED**

- (a) No person may operate an RPA over the high seas without prior coordination with the appropriate ATS authority.
- (b) The authorisation and coordination referred to in Section 27.145 and paragraph (a) of this Section shall be obtained prior to take-off if there is reasonable expectation, when planning the operation, that the aircraft may enter the airspace concerned.

#### **27.155 SPECIFIED OPERATIONAL CONDITIONS**

- (a) The operator and pilot shall operate the RPAS in accordance with conditions specified by the Authority and the State(s) in which the flight is to operate.

#### **27.160 FLIGHT PLANS SUBMITTED**

- (a) The operator and pilot shall submit the flight plans in accordance with Sections 27.205 and 27.210 or as otherwise mandated by the State(s) in which the flight is to operate.

#### **27.165 RPA PERFORMANCE**

- (a) The operator shall ensure that the RPA shall meet the performance requirements for the specific airspace in which the flight is to operate.

#### **27.170 RPA EQUIPMENT**

- (a) The operator shall ensure that the RPA shall meet the equipment carriage requirements for the specific airspace in which the flight is to operate.

### *Subdivision II: Certificates & Licensing*

#### **27.180 AIRWORTHINESS**

- (a) The RPA shall be approved by the Authority, taking into account the interdependencies of the components, in accordance with these regulations and in a manner that is consistent with the provisions of the related ICAO Annexes. In addition—
- (1) The RPA shall have a certificate of airworthiness issued in accordance with these regulations and in a manner that is consistent with the provisions of ICAO Annex 8; and

- (2) The associated RPA components specified in the type design shall be certificated and maintained in accordance with these regulations and in a manner that is consistent with the provisions of related Annexes.

### **27.185 OPERATOR CERTIFICATE REQUIRED**

- (a) No person may operate an RPA unless they hold an RPA operator certificate issued by the Authority in accordance with these regulations and in a manner that is consistent with the provisions of ICAO Annex 6.

### **27.190 REMOTE PILOT LICENCE REQUIRED**

- (a) No person may perform the functions of a remote pilot unless they hold a license issued, or validated by the Authority, in accordance with these regulations and in a manner that is consistent with the provisions of Part 7 of these Regulations and ICAO Annex 1.

## ***Subdivision III: Request for Authorisation***

### **27.200 ADVANCE REQUEST FOR AUTHORISATION REQUIRED**

- (a) The operator or pilot of the RPA shall request the authorisation referred to in Section 27.145 from the appropriate authorities of the State(s) in which the RPA will operate not less than seven days before the date of the intended flight unless otherwise specified by the State.

### **27.205 MINIMUM CONTENTS OF REQUEST**

- (a) Unless otherwise specified by the State(s), the request for authorisation shall include the following—
  - (3) Name and contact information of the operator;
  - (4) RPA characteristics (type of aircraft, maximum certificated take-off mass, number of engines, wing span);
  - (5) Copy of certificate of registration;
  - (6) Aircraft identification to be used in radiotelephony, if applicable;
  - (7) Copy of the certificate of airworthiness;
  - (8) Copy of the RPAS operator certificate;
  - (9) Copy of the remote pilot(s) licence;
  - (10) Copy of the aircraft radio station licence, if applicable;
  - (11) Description of the intended operation (to include type of operation or purpose), flight rules, visual line-of-sight (VLOS) operation if applicable, date of intended flight(s), point of departure, destination, cruising speed(s), cruising level(s), route to be followed, duration/frequency of flight;
  - (12) Take-off and landing requirements;
  - (13) RPA performance characteristics, including—
    - (i) operating speeds;
    - (ii) typical and maximum climb rates;
    - (iii) typical and maximum descent rates;
    - (iv) typical and maximum turn rates;
    - (v) other relevant performance data (e.g. limitations regarding wind, icing, precipitation); and
    - (vi) maximum aircraft endurance;
  - (14) communications, navigation and surveillance capabilities—
    - (i) aeronautical safety communications frequencies and equipment, including—
      - (A) ATC communications, including any alternate means of communication;
      - (B) command and control links (C2) including performance parameters and designated operational coverage area;
      - (C) communications between remote pilot and RPA observer, if applicable;

- (D) navigation equipment; and
  - (E) surveillance equipment (e.g. SSR transponder, ADS-B out);
  - (15) detect and avoid capabilities;
  - (16) emergency procedures, including—
    - (i) communications failure with ATC;
    - (ii) C2 failure; and
    - (iii) remote pilot/RPA observer communications failure, if applicable;
  - (17) number and location of remote pilot stations as well as handover procedures between remote pilot stations, if applicable;
  - (18) document attesting noise certification that is consistent with the provisions of Annex 16, Volume 1, if applicable;
  - (19) confirmation of compliance with national security standards in a manner that is consistent with the provisions of Annex 17, to include security measures relevant to the RPAS operation, as appropriate;
  - (20) payload information/description; and
  - (21) proof of adequate insurance/liability coverage.
- (b) When certificates or other documents identified in (a) above are issued in a language other than English, an English translation shall be included.

#### **27.210 CHANGES OR CANCELLATION**

- (a) After authorisation has been obtained from the appropriate State(s), air traffic services notification and coordination shall be completed by the operator in accordance with the requirements of the State(s).
- (b) Changes to the authorisation shall be submitted by the operator for consideration to the appropriate State(s). If the changes are approved, all affected authorities shall be notified by the operator.
- (c) In the event of a flight cancellation, the operator or remote pilot shall notify all appropriate authorities as soon as possible.

### **SUBPART E: UNMANNED FREE BALLOONS**

#### **27.220 APPLICABILITY**

- (a) This Subpart is applicable to the operations of unmanned free balloons in the national and international airspace.

#### **27.225 CLASSIFICATION OF UNMANNED FREE BALLOONS**

- (a) Unmanned free balloons shall be classified as—
  - (1) **Light:** an unmanned free balloon which carries a payload of one or more packages with a combined mass of less than 4 kg, unless qualifying as a heavy balloon in accordance with (3)(ii)(iii) or (iv) below; or
  - (2) **Medium:** an unmanned free balloon which carries a payload of two or more packages with a combined mass of 4 kg or more, but less than 6 kg, unless qualifying as a heavy balloon in accordance with (a)(3) below; or
  - (3) **Heavy:** an unmanned free balloon which carries a payload which—
    - (i) Has a combined mass of 6 kg or more; or
    - (ii) Includes a package of 3 kg or more; or
    - (iii) Includes a package of 2 kg or more with an area density of more than 13 g per square centimetre; or
    - (iv) Uses a rope or other device for suspension of the payload that requires an impact force of 230 N or more to separate the suspended payload from the balloon.

(b) The area density referred to in paragraph (a)(3)(iii) is determined by dividing the total mass in grams of the payload package by the area in square centimetres of its smallest surface.

*Note: Refer to Appendix 1 of 27.225 for a graphic description of the classifications of unmanned free balloons.*

### **27.230 APPROPRIATE AUTHORISATION FOR FLIGHT**

(a) No person may operate an unmanned free balloon without appropriate authorisation from the authority of the State from which the launch is made.

### **27.235 INTERNATIONAL OPERATIONS**

- (a) No person may operate an unmanned free balloon, other than a light balloon used exclusively for meteorological purposes and operated in the manner prescribed by the Authority, across the territory of another State without appropriate authorisation from the other State concerned.
- (1) The authorisation referred to in (b) shall be obtained prior to the launching of the balloon if there is reasonable expectation, when planning the operation, that the balloon may drift into airspace over the territory of another State.
  - (2) Such authorisation may be obtained for a series of balloon flights or for a particular type of recurring flight, e.g. atmospheric research balloon flights.

### **27.240 OPERATIONS OVER THE HIGH SEAS**

(a) No person may operate a heavy unmanned free balloon over the high seas without prior coordination with the appropriate ATS authority.

### **27.245 COMPLIANCE WITH SPECIFIED CONDITIONS & LIMITATIONS**

(a) No person may operate an unmanned free balloon unless in accordance with conditions specified by the Authority and the State(s) expected to be overflown.

### **27.250 HAZARD TO PERSONS OR PROPERTY**

(a) No person may operate an unmanned free balloon in such a manner that impact of the balloon, or any part thereof, including its payload, with the surface of the earth, creates a hazard to persons or property not associated with the operation.

### **27.255 OPERATING LIMITATIONS**

- (a) No person may operate a heavy unmanned free balloons without authorisation from the appropriate ATS authority at or through any level below 18 000 m (60 000 ft) pressure-altitude at which—
- (1) There are clouds or obscuring phenomena of more than four oktas coverage; or
  - (2) The horizontal visibility is less than 8 km.
- (b) No person may release a heavy or medium unmanned free balloon in a manner that will cause it to fly lower than 300 m (1 000 ft) over the congested areas of cities, towns or settlements or an open-air assembly of persons not associated with the operation.

### **27.260 FLIGHT TERMINATION DEVICES & RADAR TRACKING**

- (a) No person may operate a heavy unmanned free balloon unless—
- (1) It is equipped with at least two payload flight-termination devices or systems, whether automatic or operated by telecommand, that operate independently of each other;
  - (2) Tor polyethylene zero-pressure balloons, at least two methods, systems, devices, or combinations thereof, that function independently of each other are employed for terminating the flight of the balloon envelope;

*Note: Superpressure balloons do not require these devices as they quickly rise after payload discharge and burst without the need for a device or system designed to puncture the balloon*

*envelope. In this context a superpressure balloon is a simple non-extensible envelope capable of withstanding a differential of pressure, higher inside than out. It is inflated so that the smaller night-time pressure of the gas still fully extends the envelope. Such a superpressure balloon will keep essentially constant level until too much gas diffuses out of it.*

- (3) The balloon envelope is equipped with either a radar reflective device(s) or radar reflective material that will present an echo to surface radar operating in the 200 MHz to 2 700 MHz frequency range, and/or the balloon is equipped with such other devices as will permit continuous tracking by the operator beyond the range of ground-based radar.

#### **27.265 RADIO EQUIPMENT**

- (a) No person may operate a heavy unmanned free balloon under the following conditions—
  - (1) In an area where ground-based SSR equipment is in use, unless it is equipped with a secondary surveillance radar transponder, with pressure-altitude reporting capability, which is continuously operating on an assigned code, or which can be turned on when necessary by the tracking station; or
  - (2) In an area where ground-based ADS-B equipment is in use, unless it is equipped with an ADS-B transmitter, with pressure-altitude reporting capability, which is continuously operating or which can be turned on when necessary by the tracking station.

#### **27.270 TRAILING ANTENNA PENNANTS**

- (a) No person may operate an unmanned free balloon that is equipped with a trailing antenna that requires a force of more than 230 N to break it at any point unless the antenna has coloured pennants or streamers that are attached at not more than 15 m intervals.

#### **27.275 BALLOON LIGHTING**

- (a) No person may operate a heavy unmanned free balloon below 18 000 m (60 000 ft) pressure-altitude between sunset and sunrise or such other period between sunset and sunrise (corrected to the altitude of operation) as may be prescribed by the appropriate ATS authority, unless the balloon and its attachments and payload, whether or not they become separated during the operation, are lighted.

#### **27.280 SUSPENSION DEVICE**

- (a) No person may operate a heavy unmanned free balloon that is equipped with a suspension device (other than a highly conspicuously coloured open parachute) more than 15 m long between sunrise and sunset below 18 000 m (60 000 ft) pressure-altitude unless the suspension device is coloured in alternate bands of high conspicuity colours or has coloured pennants attached.

#### **27.285 ACTIVATION OF TERMINATION DEVICES**

- (a) The operator of a heavy unmanned free balloon shall activate the appropriate termination devices required by Section 27.260—
  - (1) When it becomes known that weather conditions are less than those prescribed for the operation;
  - (2) If a malfunction or any other reason makes further operation hazardous to air traffic or to persons or property on the surface; or
  - (3) Prior to unauthorised entry into the airspace over another State's territory.

#### **27.290 EARLY PRE-FLIGHT NOTIFICATION**

- (a) The operator shall make early notification of the intended flight of an unmanned free balloon in the medium or heavy category to the appropriate air traffic services unit not less than seven days before the date of the intended flight.
- (b) The operator shall provide notification of the intended flight, including such of the following information as may be required by the appropriate air traffic services unit—
  - (1) Balloon flight identification or project code name;

- (2) Balloon classification and description;
  - (3) SSR code, aircraft address or NDB frequency, as applicable;
  - (4) Operator's name and telephone number;
  - (5) Launch site;
  - (6) Estimated time of launch (or time of commencement and completion of multiple launches);
  - (7) Number of balloons to be launched and the scheduled interval between launches (if multiple launches);
  - (8) Expected direction of ascent;
  - (9) Cruising level(s) (pressure-altitude);
  - (10) The estimated elapsed time to pass 18 000 m (60 000 ft) pressure-altitude or to reach cruising level if at or below 18 000 m (60 000 ft), together with the estimated location;
  - (11) The estimated date and time of termination of the flight and the planned location of the impact/recovery area. In the case of balloons carrying out flights of long duration, as a result of which the date and time of termination of the flight and the location of impact cannot be forecast with accuracy, the term "long duration" shall be used.
- (c) If the operation consists of continuous launchings, the time to be included is the estimated time specified in paragraph (b)(10) at which the first and the last in the series will reach the appropriate level (e.g. 122136Z-130330Z).
- (d) If there is to be more than one location of impact/recovery, each location specified in paragraph (b)(11) is to be listed together with the appropriate estimated time of impact. If there is to be a series of continuous impacts, the time to be included is the estimated time of the first and the last in the series (e.g. 070330Z-072300Z).

### **27.295 PRE-LAUNCH CHANGES**

- (a) The operator shall forward any changes in the pre-launch information notified in accordance with Section 27.290(b) above to the air traffic services unit concerned—
- (1) Not less than 6 hours before the estimated time of launch; or
  - (2) In the case of solar or cosmic disturbance investigations involving a critical time element, not less than 30 minutes before the estimated time of the commencement of the operation.

### **27.300 NOTIFICATION OF LAUNCH**

- (a) Immediately after a medium or heavy unmanned free balloon is launched the operator shall notify the appropriate air traffic services unit of the following—
- (1) Balloon flight identification;
  - (2) Launch site;
  - (3) Actual time of launch;
  - (4) Estimated time at which 18 000 m (60 000 ft) pressure-altitude will be passed, or the estimated time at which the cruising level will be reached if at or below 18 000 m (60 000 ft), and the estimated location; and
  - (5) Any changes to the information previously notified in accordance with 27.290(b)(7) and (8).

### **27.305 NOTIFICATION OF CANCELLATION**

- (a) The operator shall notify the appropriate air traffic services unit immediately when it is known that the intended flight of a medium or heavy unmanned free balloon, previously notified in accordance with 27.300(a)(5) has been cancelled.

**27.310 POSITION RECORDING & REPORTING**

- (a) The operator of a heavy unmanned free balloon operating at or below 18 000 m (60 000 ft) pressure-altitude shall—
- (1) Monitor the flight path of the balloon; and
  - (2) Record the position and forward reports of the balloon's position every 2 hours; or
  - (3) At more frequent intervals if required by air traffic services
- (b) The operator of a heavy unmanned free balloon operating above 18 000 m (60 000 ft) pressure-altitude shall—
- (1) Monitor the flight progress of the balloon; and
  - (2) Record the position and forward reports of the balloon's position every 24 hours; or
  - (3) At more frequent intervals if required by air traffic services.
- (c) If a position cannot be recorded in accordance with (a) and (b), the operator shall immediately notify the appropriate air traffic services unit.
- (1) This notification shall include the last recorded position.
  - (2) The appropriate air traffic services unit shall be notified immediately when tracking of the balloon is re-established.

**27.315 REPORTING THE PLANNED DESCENT**

- (a) One hour before the beginning of planned descent of a heavy unmanned free balloon, the operator shall forward to the appropriate ATS unit the following information regarding the balloon—
- (1) the current geographical position;
  - (2) the current level (pressure-altitude);
  - (3) the forecast time of penetration of 18 000 m (60 000 ft) pressure-altitude, if applicable;
  - (4) the forecast time and location of ground impact.

**27.320 NOTIFICATION OF ENDING OF OPERATION**

- (a) The operator of a heavy or medium unmanned free balloon shall notify the appropriate air traffic services unit when the operation is ended.

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**APPENDICES**

**APPENDIX 1 TO 27.225: CLASSIFICATION OF BALLOONS**

CHARACTERISTICS		PAYLOAD MASS (kilogrammes)					
		1	2	3	4	5	6 or more
ROPE or OTHER SUSPENSION  230 Newtons or MORE		HEAVY					
INDIVIDUAL PAYLOAD PACKAGE  <div style="border: 1px dashed black; padding: 2px; width: fit-content;">                         AREA DENSITY CALCULATION  <math display="block">\frac{\text{MASS (g)}}{\text{Area of smallest surface (cm}^2\text{)}}</math> </div>	AREA DENSITY more than 13 g/cm <sup>2</sup>	LIGHT		HEAVY			
	AREA DENSITY less than 13 g/cm <sup>2</sup>	LIGHT					
COMBINED MASS (if Suspension OR Area density OR Mass of individual package are not factors)		LIGHT		MEDIUM		HEAVY	
		LIGHT		MEDIUM			

*End of RCAR Part 27*