REPUBLIC OF MAURITIUS

DEPARTMENT OF CIVIL AVIATION

Sir Seewoosagur Ramgoolam International Airport, Plaine Magnien

MAURITIUS CIVIL AVIATION REQUIREMENTS

MCAR BALLOONS

ISSUE 1 | REV 0

30 June 2025

FOREWORD

The Director of Civil Aviation (hereinafter referred to as the 'Authority') is the competent Authority responsible for the regulation of Civil Aviation in the Republic of Mauritius.

This MCAR-Balloons aims to enhance aviation safety by ensuring that all concerned stakeholders are aware of and adhere to the relevant regulations.

This MCAR-Balloons provides a set of requirements designed to provide a clear and easily understandable framework for balloon operations, licensing, and airworthiness for individuals and organisations involved in ballooning.

This MCAR-Balloons is divided into separate Parts namely:

Part-Def	Definitions
Part-BOP	Balloon Air Operations
Part-BFCL	Requirements for Balloons Flight Crew Licensing
Part-ML	Continuing Airworthiness
CS-31	Certification Specifications for Initial Airworthiness

Any suggestion on these requirements should be sent to the Director of Civil Aviation via email on civil-aviation@govmu.org for review and consideration.

This MCAR-Balloons will be effective as from 30 June 2025.

I POKHUN
Director of Civil Aviation

RECORD OF REVISIONS

Revision Number.	Date of issue	Entered by
Issue 1 Rev 0	30 June 2025	DCA

NOTE

The content of this document is arranged as follows: the cover regulation (recitals and articles) with the implementing requirement (IR) or delegated act (DA) points, as regulation, appears first, followed by the related acceptable means of compliance (AMC) and guidance material (GM) paragraph(s).

In case of certification specifications (CS), a CS paragraph is followed by the related AMC and GM paragraph.

All elements (i.e. cover regulation, regulation, AMC, and GM) are colour-coded and can be identified according to the illustration below.

Regulation

Certification specification

Acceptable means of compliance

Guidance material

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CHAPTER 1 — AIR OPERATIONS AND LICENSING

PART – DEFINITIONS (Part-DEF)

Definitions

For the purpose of this MCAR, MCAR-0 (Definitions) does not apply and the following definitions shall apply:

1. "acceptable means of compliance (AMC)" means non-binding standards adopted by the Authority to illustrate means to establish compliance with the Civil Aviation Regulations and its associated MCAR's;

2. "alternative means of compliance (AltMoC)" means those means that propose an alternative to an existing AMC or those that propose new means to establish compliance with the Civil Aviation Regulations and its associated MCAR's for which no associated AMC have been adopted by the Authority;

3. 'pilot-in-command' means the pilot designated as being in command and charged with the safe conduct of the flight;

4. 'crew member' means a person assigned by an operator to perform duties on board the balloon or, where the duties are directly related to the operation of the balloon, on the ground;

5. 'flight crew member' means a licensed crew member charged with duties essential to the operation of an aircraft during a flight duty period;

6. 'psychoactive substances' means alcohol, opioids, cannabinoids, sedatives and hypnotics, cocaine, other psychostimulants, hallucinogens and volatile solvents, excluding coffee and tobacco;

7. 'accident' means an occurrence associated with the operation of a balloon which takes place between the moment of the commencement of the inflation of the balloon and the moment of complete deflation of the balloon, in which:

   (a) a person suffers fatal or serious injuries as a result of being in the balloon or as a result of direct contact with any part of the balloon, including parts which have become detached from the balloon, but excluding any injuries arising from natural causes or which are self-inflicted or inflicted by other persons;

   (b) the balloon sustains damage or structural failure which adversely affects its structural strength, performance or flight characteristics and requires major repair or replacement of the affected component; or

   (c) the balloon is missing or is completely inaccessible;

8. 'incident' means an occurrence, other than an accident, associated with the operation of a balloon which affects or could affect the safety of its operation;

9. ‘serious incident’ means an occurrence associated with the operation of the balloon which takes place between the moment of the commencement of the inflation of the balloon and the moment of complete deflation of the balloon, in which there was a high probability of an accident;

10. ‘critical phases of flight’ means take-off, final approach, missed approach, landing and any other phases of a flight which the pilot-in-command determines as critical for the safe operation of the balloon;

11. ‘aircraft flight manual (AFM)’ means the document containing the applicable and approved operating limitations and information with respect to the balloon;

11a. “flight time” means the total time from the moment the basket leaves the ground for the purpose of taking off until the moment it finally comes to a rest at the end of the flight;

12. ‘dangerous goods’ means articles or substances which are capable of posing a risk to health, safety, property or the environment and which are shown in the list of dangerous goods in the technical instructions or which are to be classified as such in accordance with those instructions;

13. ‘technical instructions’ means the latest applicable edition of the ‘Technical instructions for the safe transport of dangerous goods by air’, including the supplement and any addenda, published by ICAO in document 9284-AN/905;

14. ‘operating site’ means a site selected by the pilot-in-command or the operator for landing, take-off or external load operations;

15. ‘refuelling’ means the refilling of fuel cylinders or fuel tanks from an external source, excluding the replacement of fuel cylinders;

16. ‘night’ means the period between the end of evening civil twilight and the beginning of morning civil twilight. Civil twilight ends in the evening when the centre of the sun's disc is 6 degrees below the horizon and begins in the morning when the centre of the sun's disc is 6 degrees below the horizon;

17. ‘balloon specialised operation’ means any operation, which can be commercial or non-commercial, with a balloon the main purpose of which is not the carriage of passengers for sightseeing or experience flights, but parachute operations, hang-gliding dropping, flying displays, competition flights or similar specialised activities;

17a. “class of balloons” means a categorisation of balloons taking into account the lifting means used to sustain flight;

17b. “proficiency check” means the demonstration of skill for the purpose of complying with the recency requirements as established in this MCAR, including oral examinations as may be required;

18. ‘traffic load’ means the total mass of passengers, baggage and carry-on specialist equipment;

19. ‘balloon empty mass’ means the mass determined by weighing the balloon with all the installed equipment as specified in the AFM;

20. ‘wet lease agreement’ means an agreement between operators pursuant to which the balloon is operated under the responsibility of the lessor;

21. ‘commercial passenger ballooning’ (CPB) means a form of commercial air transport operation with a balloon whereby passengers are carried on sightseeing or experience flights for remuneration or other valuable consideration;

22. “group of balloons” means a categorisation of balloons, taking into account the size or capacity of the envelope;

23. “skill test” means the demonstration of skill for the purpose of issuing a licence or rating, or extension of a privilege, including oral examinations as may be required;

24. “assessment of competence” means the demonstration of skill, knowledge and attitude for the initial issue, revalidation or renewal of an instructor or examiner certificate;

25. “solo flight” means a flight during which a student pilot is the sole occupant of the balloon;

26. “tethered flight” means a flight with a tether system that anchors the balloon to a fixed location during operation, with the exception of a tether which may be used as part of the take-off procedure.

FCL.010 Definitions related to Part-BFCL

List of definitions relevant in the content of Part-BFCL of this MCAR:

- "Aircraft" means any machine which can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth’s surface.

- "Airship" means a power-driven lighter-than-air aircraft, with the exception of hot-air airships, which are considered to be balloons in accordance with the Civil Aviation Regulations.

- "Balloon" means a lighter-than-air aircraft which is not engine-driven and sustains flight through the use of either gas or an airborne heater. For the purposes of this Part, a hot-air airship, although engine-driven, is also considered a balloon.

- "Competency" means a combination of skills, knowledge and attitude required to perform a task to the prescribed standard.

- "Dual instruction time" means flight time or instrument ground time during which a person is receiving flight instruction from a properly authorised instructor.

- "Error" means an action or inaction taken by the flight crew which leads to deviations from organisational or flight intentions or expectations.

- "Error management" means the process of detecting and responding to errors with countermeasures which reduce or eliminate the consequences of errors, and mitigate the probability of errors or undesired aircraft states.

- "Night" means the period between the end of evening civil twilight and the beginning of morning civil twilight or such other period between sunset and sunrise as may be prescribed by the appropriate authority.

- "Pilot-in-command" (PIC) means the pilot designated as being in command and charged with the safe conduct of the flight.

- "Renewal" (of, e.g. a rating or certificate) means the administrative action taken after a rating or certificate has lapsed for the purpose of renewing the privileges of the rating or certificate for a further specified period consequent upon the fulfilment of specified requirements.

- "Revalidation" (of, e.g. a rating or certificate) means the administrative action taken within the period of validity of a rating or certificate which allows the holder to continue to exercise the privileges of a rating or certificate for a further specified period consequent upon the fulfilment of specified requirements.

- "Threat" means events or errors which occur beyond the influence of the flight crew, increase operational complexity and which must be managed to maintain the margin of safety.

- "Threat management" means the process of detecting and responding to the threats with countermeasures which reduce or eliminate the consequences of threats, and mitigate the probability of errors or undesired aircraft states.

PART — BALLOON AIR OPERATIONS (Part-BOP)

SUBPART BAS — BASIC OPERATIONAL REQUIREMENTS

SECTION 1 – GENERAL REQUIREMENTS

BOP.BAS.001 Scope

For the purpose of regulations 7(7), 14(2)(b), 14(5), 14A, 33, 34(3), 34(4), 49(g) and 90 of the Civil Aviation Regulations, this Subpart establishes the requirements to be met by any operator of balloons, other than the design or production organisations.

AMC1 BOP.BAS.001 Scope

AERIAL ADVERTISING FLIGHT

An aerial advertising flight, displaying a logotype or an advertisement on the balloon, should only be considered a commercial operation, when:

(a) especially conducted at a specific time and for an advertising purpose; and

(b) conducted in return for remuneration or other valuable consideration from the principal, with or without the existence of a contract.

GM1 BOP.BAS.001 Scope

MIXED BALLOONS

Mixed balloons are operated in accordance with the requirements for hot-air balloons, unless otherwise specified.

BOP.BAS.005 Competent authority

For the purpose of this MCAR, the Authority shall be the competent authority of the State where the operator has its principal place of business or, where the operator has no principal place of business, the place where the operator is established or resides.

BOP.BAS.010 Demonstration of compliance

(a) An operator shall, when so requested by the Authority which verifies continued compliance by the operator in accordance with point ARO.GEN.300(a)(2) of MCAR-Part-ARO, demonstrate compliance with the essential requirements set out in the Civil Aviation Regulations and with the requirements of this MCAR.

(b) The operator shall use either of the following means to demonstrate such compliance:

(1) acceptable means of compliance (AMC);

(2) alternative means of compliance (AltMoC).

BOP.BAS.015 Introductory flights

Introductory flights shall be:

(a) operated under visual flight rules (VFR) by day; and

(b) overseen as regards their safety by a person who has been nominated by the organisation performing the introductory flights.

BOP.BAS.020 Immediate reaction to a safety problem

The operator shall implement:

(a) safety measures mandated by the competent authority in accordance with paragraph (c) of point ARO.GEN.135 of MCAR-Part-ARO; and

(b) airworthiness directives and other mandatory information issued by the primary State of certification.

BOP.BAS.025 Designation as pilot-in-command

The operator shall designate a pilot-in-command who is qualified to act as pilot-in-command in accordance with Part-BFCL to this MCAR.

BOP.BAS.030 Responsibilities of the pilot-in-command

(a) The pilot-in-command shall:

(1) be responsible for the safety of the balloon and of any person or property carried therein during balloon operations;

(2) be responsible for the initiation, continuation or termination of a flight in the interest of safety;

(3) ensure that all applicable operational procedures and checklists are complied with;

(4) only commence a flight if he or she is satisfied that all operational limitations are complied with, as follows:

(i) the balloon is airworthy;

(ii) the balloon is duly registered;

(iii) instruments and equipment required for the execution of the flight are carried on board the balloon and are operative;

(iv) the mass of the balloon is such that the flight can be conducted within the limits defined by the AFM;

(v) all equipment and baggage are properly loaded and secured; and

(vi) the operating limitations of the balloon as specified in the AFM will not be exceeded at any time during the flight;

(5) ensure that the pre-flight inspection has been carried out as required by MCAR-Part-145;

(6) be responsible for the pre-flight briefing of persons assisting in the inflation and deflation of the envelope;

(7) ensure that persons assisting in the inflation and deflation of the envelope wear appropriate protective clothing;

(8) be satisfied that relevant emergency equipment remains easily accessible for immediate use;

(9) ensure that no person is smoking on board or within the direct vicinity of the balloon;

(10) not allow a person to be carried in the balloon who appears to be under the influence of psychoactive substances to the extent that the safety of the balloon or of any person or property carried therein is likely to be endangered;

(11) remain during flight in control of the balloon at all times except if another pilot is taking the controls;

(12) take any action in an emergency situation that requires immediate decision and action which he or she considers necessary under the circumstances. In such cases he or she may deviate from rules, operational procedures and methods to the extent necessary in the interest of safety;

(13) not continue a flight beyond the nearest weather-permissible operating site when his or her capacity to perform his or her duties is significantly reduced because of sickness, fatigue, lack of oxygen or any other cause;

(14) record utilisation data and all known or suspected defects in the balloon at the termination of the flight, or series of flights, in the balloon logbook;

(15) notify the Authority and the emergency services without delay by the quickest available means of any serious incident or accident involving the balloon;

(16) submit a report of an act of unlawful interference without delay to the Authority and inform the local authority of the location in which the unlawful interference took place; and

(17) report to the appropriate air traffic services (ATS) unit, without delay, any hazardous weather or flight conditions encountered that are likely to affect the safety of other aircraft.

(b) The pilot-in-command shall not perform duties on a balloon in one of the following situations:

(1) when he or she is incapacitated from performing his or her duties by any cause, including injury, sickness, medication, fatigue or the effects of any psychoactive substance, or feels otherwise unfit;

(2) if applicable medical requirements are not fulfilled.

(c) Whenever crew members are involved in the operation of the balloon, the pilot-in-command shall:

(1) ensure that during critical phases of flight or whenever deemed necessary in the interest of safety, all crew members are at their assigned stations and do not perform any activities other than those required for the safe operation of the balloon;

(2) not commence a flight if any crew member is incapacitated from performing his or her duties by any cause, including injury, sickness, medication, fatigue or the effects of any psychoactive substance, or feels otherwise unfit;

(3) not continue a flight beyond the nearest weather-permissible operating site when any crew member's capacity to perform duties is significantly reduced because of sickness, fatigue or lack of oxygen or any other cause; and

(4) ensure that all crew members can communicate with each other in a common language.

GM1 BOP.BAS.030 Responsibilities of the pilot-in-command

GENERAL

In accordance with the essential requirements for air operations, which are laid down in the Civil Aviation Regulations, the pilot-in-command is responsible for the operation and safety of the balloon and for the safety of all passengers on board. This includes the following:

(a) the safety of all passengers on board, as soon as he or she arrives on board until he or she leaves the balloon at the end of the flight; and

(b) the operation and safety of the balloon from the moment the balloon is unloaded from the retrieve vehicle or trailer to the moment the balloon is reloaded, unless the preparation of the flight is delegated to a crew member.

AMC1 BOP.BAS.030(a)(3) Responsibilities of the pilot-in-command

CHECKLISTS

(a) The pilot-in-command should use the latest checklists provided by the manufacturer or the operator.

(b) If checks conducted before take-off are suspended at any point, the pilot-in-command should restart them from a safe point prior to the interruption.

GM1 BOP.BAS.030(a)(7) Responsibilities of the pilot-in-command

PROTECTIVE CLOTHING

Protective clothing includes:

(a) long sleeves and trousers preferably made of natural fibres;

(b) stout footwear; and

(c) gloves.

GM1 BOP.BAS.030(a)(14) Responsibilities of the pilot-in-command

RECORDING UTILISATION DATA

Where a balloon conducts a series of flights of short duration and is operated by the same pilot-in-command, the utilisation data for the series of flights may be recorded in the balloon logbook as a single entry.

AMC1 BOP.BAS.030(a)(17) Responsibilities of the pilot-in-command

REPORTING OF HAZARDOUS FLIGHT CONDITIONS

(a) These reports should include any detail which may be pertinent to the safety of other aircraft.

(b) When unexpected meteorological conditions affecting other aircraft are encountered that, in the opinion of the pilot-in-command, may affect the safety of other aircraft operations, he or she should advise the appropriate air traffic services (ATS) unit as soon as practicable.

AMC1 BOP.BAS.030(b)(1) & AMC1 BOP.BAS.040(b) Responsibilities of the pilot-in-command & responsibilities of crew members

ALCOHOL CONSUMPTION

The operator should issue instructions concerning the consumption of alcohol by the pilot-in-command and the crew members. The instructions should not be less restrictive than the following:

(a) no alcohol should be consumed less than 8 hours prior to an operation;

(b) the blood alcohol level should not exceed the lower of the national requirements or 0.2 grams of alcohol in 1 litre of blood at the start of an operation; and

(c) no alcohol should be consumed during the operation.

GM1 BOP.BAS.030(b)(1);(2) & GM1 BOP.BAS.040(b) Responsibilities of the pilot-in-command & responsibilities of crew members

PART-MED

Information on the effects of medication, psychoactive substances and other treatments can be found in MCAR-Part-MED.

BOP.BAS.035 Authority of the pilot-in-command

The pilot-in-command shall have the authority to:

(a) give all commands and take any appropriate actions for the purpose of ensuring the safety of the balloon and of any person or property carried therein; and

(b) refuse embarkation or carriage of any person or baggage that may represent a potential hazard to the safety of the balloon or of any person or property carried therein.

BOP.BAS.040 Responsibilities of crew members

(a) Any crew member shall be responsible for the proper execution of his or her duties in respect of the operation of the balloon.

(b) Crew members shall not perform duties on a balloon when incapacitated by any cause, including injury, sickness, medication, fatigue or the effects of any psychoactive substance, or if he or she feels otherwise unfit.

(c) Crew members shall report to the pilot-in-command both of the following:

(1) any fault, failure, malfunction or defect, which he or she believes may affect the airworthiness or safe operation of the balloon, including emergency systems;

(2) any incident.

(d) Any flight crew member who undertakes duties for more than one operator shall:

(1) maintain his or her individual records regarding flight times and rest periods, if applicable; and

(2) provide each operator with the data needed to schedule activities in accordance with the applicable flight and duty time limitations and rest requirements.

GM1 BOP.BAS.040 Responsibilities of crew members

DESIGNATION OF PERSONS AS CREW MEMBERS

(a) The pilot-in-command or the operator may designate any person as a crew member provided that:

(1) the role, according to the reasonable expectation of the pilot-in-command or the operator, will enhance the safety of the flight or achieve an operational objective of the flight;

(2) the person, according to the reasonable expectation of the pilot-in-command or the operator, is capable of fulfilling the role;

(3) the person has been briefed on the role as a crew member and informed that he or she is crew, not a passenger; and

(4) the person agrees to the role as crew member.

(b) Crew members are not considered to be passengers.

(c) Crew members may be required, by specific provisions of this MCAR and other MCAR'S, to hold licences, ratings or other personnel certificates to fulfil certain roles such as instructor or examiner, in certain circumstances.

BOP.BAS.045 Compliance with laws, regulations and procedures

(a) The pilot-in-command and all other crew members shall comply with the laws, regulations and procedures published by the Authority.

(b) The pilot-in-command shall be familiar with the laws, regulations and procedures, pertinent to the performance of his or her duties, prescribed for the areas to be traversed, the operating sites to be used and the related air navigation facilities.

BOP.BAS.050 Documents, manuals and information to be carried

(a) All of the following documents, manuals and information shall be carried on each flight, as originals or copies:

(1) the operating limitations, normal, abnormal and emergency procedures and other relevant information specific to the balloon's operating characteristics;

(2) details of the filed ATS flight plan, when required in accordance with MCAR-Part-ROA;

(3) current and suitable aeronautical charts for the area of the intended flight.

(b) All of the following documents, manuals and information shall be carried on each flight or shall be stowed in the retrieve vehicle, as originals or copies:

(1) the certificate of registration;

(2) the certificate of airworthiness, including the annexes;

(3) the AFM or equivalent document(s);

(4) the aircraft radio licence, where the balloon is equipped with radio communication equipment in accordance with point (a) of point BOP.BAS.355;

(5) the third party liability insurance certificate(s);

(6) the balloon logbook or equivalent document(s);

(7) any other documentation that may be pertinent to the flight or is required by the State or States concerned with the flight.

(c) When requested by the Authority, the pilot-in-command or the operator shall make available to that authority the original documentation within the time period specified by the authority which shall not be less than 24 hours.

GM1 BOP.BAS.050 Documents, manuals and information to be carried

GENERAL

(a) In case of loss or theft of documents specified in BOP.BAS.050, the operation may continue until the balloon has landed. The operator provides replacement documentation within the shortest possible time frame.

(b) The documents, manuals and information may be available in a form other than on printed paper. An electronic storage medium is acceptable if accessibility, usability and reliability is assured.

AMC1 BOP.BAS.050(a)(1) Documents, manuals and information to be carried

OPERATING LIMITATIONS, NORMAL, ABNORMAL AND EMERGENCY PROCEDURES

The operating limitations, as well as normal, abnormal and emergency procedures should be available to the pilot during the operation by providing the specific sections of the aircraft flight manual (AFM) or by other means that effectively accomplish the purpose.

AMC1 BOP.BAS.050(a)(3) Documents, manuals and information to be carried

CURRENT AND SUITABLE AERONAUTICAL CHARTS

(a) The aeronautical charts carried should contain data appropriate to the applicable air traffic regulations, rules of the air, flight altitudes, area, route, and nature of the operation. Due consideration should be given to the carriage of textual and graphic representations of:

(1) aeronautical data, including, as appropriate for the nature of the operation:

(i) airspace structure;

(ii) communication frequencies;

(iii) prohibited, restricted and danger areas;

(iv) sites of other relevant activities that may hazard the flight; and

(2) topographical data, including terrain and obstacle data.

(b) A combination of different charts and textual data may be used to provide adequate and current data.

(c) The aeronautical data should be relevant for the current aeronautical information regulation and control (AIRAC) cycle.

(d) The topographical data should be reasonably recent, as regards the nature of the planned operation.

AMC1 BOP.BAS.050(b)(2) Documents, manuals and information to be carried

CERTIFICATE OF AIRWORTHINESS

The certificate of airworthiness should be a normal certificate of airworthiness, a restricted certificate of airworthiness, or a permit to fly issued in accordance with the applicable airworthiness requirements.

GM1 BOP.BAS.050(b)(3) Documents, manuals and information to be carried

AFM OR EQUIVALENT DOCUMENT

'AFM or equivalent document(s)' means the flight manual for the balloon or other documents containing information required for the operation of the balloon within the terms of its certificate of airworthiness.

GM1 BOP.BAS.050(b)(6) Documents, manuals and information to be carried

BALLOON LOGBOOK OR EQUIVALENT DOCUMENT

'Balloon logbook or equivalent document(s)' means that the required information may be recorded in documentation other than a logbook, such as the operational flight plan or the balloon technical log.

GM1 BOP.BAS.050(b)(7) Documents, manuals and information to be carried

DOCUMENTS THAT MAY BE PERTINENT TO THE FLIGHT AND STATES CONCERNED WITH THE FLIGHT

(a) Any other documents that may be pertinent to the flight or are required by the States concerned with the flight may include, for example, forms to comply with reporting requirements.

(b) The States concerned are those of origin, overflight and destination of the flight.

BOP.BAS.055 Dangerous goods

(a) The transport of dangerous goods on board the balloon shall be conducted in accordance with the requirements set out in Annex 18 to the Chicago Convention, as last amended and amplified by the technical instructions.

(b) The pilot-in-command shall take all reasonable measures to prevent dangerous goods from being carried on board the balloon inadvertently.

(c) Reasonable quantities of articles and substances that would otherwise be classified as dangerous goods and that are used to facilitate flight safety, where carriage on board the balloon is advisable to ensure their timely availability for operational purposes, shall be considered authorised under point 2.2.1(a) of Part 1 of the Technical Instructions, regardless of whether or not such articles and substances are required to be carried or intended to be used in connection with a particular flight. The pilot-in-command shall ensure that the packing and loading on board the balloon of those articles and substances is performed in such a way as to minimise the risks posed to crew members, passengers and the balloon during operation.

(d) The pilot-in-command or, when the pilot-in-command is incapacitated, the operator shall report without delay any accidents or incidents involving dangerous goods to the Authority, the emergency services of the location.

GM1 BOP.BAS.055 Dangerous goods

GENERAL

The carriage of dangerous goods is only permitted when:

(a) they are not subject to the 'Technical instructions for the safe transport of dangerous goods by air', ICAO Doc 9284-AN/905, in accordance with Part 1 of those instructions. Following the technical instructions, articles and substances which would otherwise be classified as dangerous goods, but which are required on board the balloon in accordance with the pertinent airworthiness requirements or the requirements of this MCAR, are permitted;

(b) they are carried by crew members or passengers, or are in baggage, in accordance with Part 8 of the technical instructions; or

(c) they are required on board the balloon for specialised purposes in accordance with the technical instructions.

GM2 BOP.BAS.055 Dangerous goods

EXAMPLES

Dangerous goods include the following:

(a) explosives (fireworks, flares, detonators, fuses, dynamite, ammunition and materials for fireworks in general);

(b) compressed or refrigerated liquid, or dissolved gases (aerosols, self-defence sprays, camping gas, extinguishers, cryogenic liquids, bottles with cooling gases and compressed gas cylinders in general);

(c) flammable liquids and solids (fuel, equipment containing fuel, adhesives, solvents, paint, petrol, varnish, torches, cigarette lighters and lighter refills);

(d) substances that emit flammable gases in contact with water;

(e) oxidisers and organic peroxides (oxygen generators and bleaching powder); and

(f) substances liable to spontaneous combustion (strike-anywhere matches and phosphorous).

BOP.BAS.060 Release of dangerous goods

(a) The pilot-in-command shall not release dangerous goods when operating a balloon over congested areas of cities, towns or settlements or over an open-air assembly of persons.

(b) Notwithstanding point (a), parachutists may exit the balloon for the purpose of parachute display over those congested areas or over that open-air assembly of persons whilst carrying smoke trail devices that were manufactured for that purpose.

BOP.BAS.065 Balloon logbook

For each flight, or series of flights, particulars of the balloon, its crew and each journey shall be retained in the form of a balloon logbook or an equivalent document.

AMC1 BOP.BAS.065 Balloon logbook

GENERAL

The balloon logbook, or equivalent, should include the following items, where applicable:

(a) balloon nationality and registration;

(b) date;

(c) name(s) of flight crew member(s);

(d) place of departure;

(e) place of arrival;

(f) time of departure;

(g) time of arrival;

(h) hours of flight;

(i) type of operation;

(j) incidents and observations, if any; and

(k) signature of the pilot-in-command.

GM1 BOP.BAS.065 Balloon logbook

SERIES OF FLIGHTS

(a) 'Series of flights' means consecutive flights, which begin and end:

(1) within a 6-hour period;

(2) at the same operating site or remain within a local area; and

(3) with the same pilot-in-command of the balloon.

(b) The term 'series of flights' is used to facilitate a single set of documentation.

SECTION 2 – OPERATING PROCEDURES

BOP.BAS.100 Use of operating sites

The pilot-in-command shall only use operating sites that are adequate for the type of balloon and operation concerned.

BOP.BAS.105 Noise abatement procedures

The pilot-in-command shall take into account operating procedures to minimise the effect of heating-system noise, while ensuring however that safety has priority over noise abatement.

BOP.BAS.110 Fuel and ballast supply and planning

The pilot-in-command shall only commence a flight if the reserve fuel or ballast carried on board the balloon is sufficient to ensure a safe landing.

AMC1 BOP.BAS.110 Fuel and ballast supply and planning

GENERAL

(a) The pilot-in-command should only commence a flight if the reserve fuel or ballast is sufficient for 30 minutes of flight.

(b) Notwithstanding (a), the pilot-in-command should only commence a flight if the reserve fuel (for the burner, and, in case of hot-air airships, also for the engine) or ballast is sufficient for 15 minutes of flight for:

(1) hot-air balloons equipped with a single fuel tank; and

(2) hot-air airships, when the flight is conducted in the vicinity of the operating site.

(c) Fuel or ballast supply calculations should be based upon at least the following operating conditions under which the flight is to be conducted:

(1) data provided by the balloon manufacturer;

(2) anticipated masses;

(3) expected meteorological conditions; and

(4) air navigation services provider procedures and restrictions.

BOP.BAS.115 Passenger briefing

The pilot-in-command shall ensure that before and, when appropriate, during the flight passengers are given a briefing on normal, abnormal and emergency procedures.

AMC1 BOP.BAS.115 Passenger briefing

GENERAL

(a) Passengers should be given a verbal briefing and demonstration about safety matters in such a way that the information is easily retained and applied during the landing and in the case of an emergency situation.

(b) The briefing/demonstration should include the following items:

(1) safety in relation to ground equipment;

(2) use of internal handholds;

(3) wearing of suitable clothing;

(4) smoking regulations;

(5) in-flight use and stowage of personal belongings and baggage;

(6) importance to remain inside the basket at all times, particularly after landing;

(7) landing positions to be assumed to minimise the effect of the impact during landing;

(8) safe manoeuvring of the balloon on the ground after landing;

(9) use of oxygen-dispensing equipment, if applicable; and

(10) other emergency equipment provided for individual passenger use, if applicable.

(c) Part or all of the verbal briefing may be provided additionally by a safety briefing card on which pictorial instructions indicate the correct landing position.

(d) Before take-off, the correct landing position should be demonstrated.

(e) Before commencing the landing phase, passengers should be required to practise the correct landing position.

GM1 BOP.BAS.115 Passenger briefing

GENERAL

The pilot-in-command or a person designated by the operator is carrying out the passenger briefing.

BOP.BAS.120 Carriage of special categories of passengers

The pilot-in-command shall ensure that persons requiring special conditions, assistance or devices when carried on board a balloon are carried under conditions that ensure the safety of the balloon and of any persons or property carried therein.

AMC1 BOP.BAS.120 Carriage of special categories of passengers

CARRIAGE OF CHILDREN AND PERSONS WITH REDUCED MOBILITY

The pilot-in-command may exclude children or persons with reduced mobility from transportation in a balloon when:

(a) their presence may impede:

(1) the crew in their duties;

(2) access to emergency equipment; or

(3) the emergency evacuation of the balloon; or

(b) those persons are:

(1) unable to take a proper brace position;

(2) smaller than the inner height of the basket wall; or

(3) unable to understand the passenger briefing.

BOP.BAS.125 Submission of the air traffic service flight plan

(a) If an air traffic service (ATS) flight plan is not submitted because it is not required in accordance with MCAR-Part-ROA, the pilot-in-command shall submit adequate information in order to permit alerting services to be activated if required.

(b) When operating from an operating site where it is impossible to submit an ATS flight plan, although required in accordance with MCAR-Part-ROA, the pilot-in-command shall submit the ATS flight plan after take-off.

AMC1 BOP.BAS.125 Submission of the air traffic service flight plan

FLIGHTS WITHOUT ATS FLIGHT PLAN

(a) The operator should nominate a person to be responsible for alerting search and rescue services for flights without submitted ATS flight plans.

(b) The operator should establish procedures to ensure that the expected route of each flight is communicated to the ground crew, and should:

(1) provide the nominated person with at least the information required to be included in a visual flight rules (VFR) flight plan;

(2) notify the appropriate ATS or search and rescue facility when a balloon is overdue or missing; and

(3) ensure that the information is retained at a designated place until the completion of the flight.

BOP.BAS.130 Flight preparation

Before commencing the flight, the pilot-in-command shall be familiar with the available meteorological and aeronautical information appropriate to the intended flight which includes both of the following:

(a) a study of available current weather reports and forecasts;

(b) the planning of an alternative course of action to provide for the eventuality that the flight cannot be completed as planned.

BOP.BAS.135 Smoking on board

No person shall smoke on board a balloon during any phase of flight or within the direct vicinity of a balloon.

BOP.BAS.140 Carriage and use of weapons

(a) The pilot-in-command shall ensure that no person carries and uses a weapon on board the balloon.

(b) By way of derogation from point (a), the pilot-in-command may permit the carriage and use of weapons on board the balloon when required for the safety of the crew members or the passengers. In such cases the pilot-in- command shall ensure that the weapons are secured when not in use.

BOP.BAS.145 Meteorological conditions

The pilot-in-command shall only commence or continue a VFR flight if the latest available meteorological information indicates that the weather conditions along the route and at the intended destination at the estimated time of use are as follows:

(a) at or above the applicable VFR operating minima; and

(b) within the meteorological limitations specified in the AFM.

BOP.BAS.150 Take-off conditions

The pilot-in-command shall be satisfied before commencing take-off of the balloon that, according to the latest available information, the weather at the operating site permits a safe take-off and departure.

AMC1 BOP.BAS.150 Take-off conditions

FACILITIES AT THE TAKE-OFF SITE

At the balloon take-off site a means of assessing wind direction and wind speed should be available to the pilot-in-command.

BOP.BAS.155 Approach and landing conditions

Except in emergency situations, the pilot-in-command shall be satisfied before commencing an approach to land that, according to the latest available information, the conditions at the intended operating site permit a safe approach and landing.

BOP.BAS.160 Simulated situations in flight

(a) The pilot-in-command shall not simulate situations that require the application of abnormal or emergency procedures when carrying passengers.

(b) By way of derogation from point (a), the pilot-in-command may simulate such situations, during operations other than commercial operations of the balloon, when conducting training flights either with student pilots or with passengers, provided that the passengers have been duly informed and agreed to the simulation in advance.

BOP.BAS.165 In-flight fuel management

The pilot-in-command shall check at regular intervals during the flight that the amount of usable fuel or ballast remaining in flight is not less than the fuel or ballast needed to complete the intended flight and the reserve planned for landing.

BOP.BAS.170 Refuelling with persons on board

(a) Refuelling of balloons shall not be conducted when persons are on board.

(b) By derogation from point (a), refuelling the engine of hot-air airships may be conducted with the pilot-in-command on board.

GM1 BOP.BAS.170 Refuelling with persons on board

REPLACEMENT OF FUEL CYLINDERS

The definition of 'refuelling' in Part-DEF excludes the replacement of fuel cylinders. Therefore, the replacement of fuel cylinders may be conducted, observing the appropriate precautions, when persons are on board.

BOP.BAS.175 Use of restraint system

When a restraint system is required in accordance with point BOP.BAS.320, the pilot-in-command shall wear the system at least during landing.

BOP.BAS.180 Use of supplemental oxygen

The pilot-in-command shall ensure that:

(a) all crew members engaged in performing duties essential to the safe operation of the balloon use supplemental oxygen continuously whenever he or she determines that, at the altitude of the intended flight, the lack of oxygen might result in impairment of the faculties of crew members; and

(b) supplemental oxygen is available to passengers when lack of oxygen might harmfully affect them.

AMC1 BOP.BAS.180 Use of supplemental oxygen

GENERAL

When the pilot-in-command cannot determine how the lack of oxygen might affect all occupants on board, he or she should ensure that:

(a) all flight crew members engaged in performing duties essential to the safe operation of a balloon use supplemental oxygen for any period in excess of 30 minutes when the pressure altitude is between 10 000 and 13 000 ft; and

(b) all occupants use supplemental oxygen for any period when the pressure altitude is above 13 000 ft.

BOP.BAS.185 Operational limitations at night

(a) Hot-air balloons:

(1) shall not land during night, except in emergency situations; and

(2) may take off during night, provided that sufficient fuel or ballast is carried for a landing during day.

(b) Gas balloons and mixed balloons:

(1) shall not land during night, except in emergency situations or as a precautionary landing; and

(2) may take off during night, provided that sufficient fuel or ballast is carried for a landing during day.

(c) Hot-air airships shall be operated in accordance with their approved VFR night operating limitations and information.

GM1 BOP.BAS.185(a);(b) Operational limitations at night

AVOIDANCE OF NIGHT LANDING

(a) The intent of the rule is to ensure that when the balloon takes off during night, sufficient fuel is on board for landing under VFR by day.

(b) The risk of collision with overhead lines or other obstacles is considerable and cannot be overstated. The risk is considerably increased during night flights, in conditions of failing light and visibility, when there is increasing pressure to land. A number of incidents have occurred in the late evening in such conditions, and may have been avoided had an earlier landing been planned.

BOP.BAS.190 Balloon specialised operations — Risk assessment and checklist

(a) Before commencing a balloon specialised operation, the pilot-in-command shall conduct a risk assessment, assessing the complexity of the activity in order to determine the hazards and associated risks of the intended operation and establish mitigating measures where necessary.

(b) A balloon specialised operation shall be performed in accordance with a checklist. The pilot-in-command shall establish that checklist and ensure that it is appropriate to the specialised activity and balloon used, based on the risk assessment and taking account of all requirements set out in this Subpart. The checklist shall be readily accessible on each flight to the pilot-in-command and other crew members, where it is relevant for the performance of their duties.

(c) The pilot-in-command shall regularly review and update the checklist where necessary in order to adequately take account of the risk assessment.

AMC1 BOP.BAS.190 Balloon specialised operations — Risk assessment and checklist

CRITERIA FOR BALLOON SPECIALISED OPERATIONS

The pilot-in-command or the operator should consider the following criteria to determine whether an activity falls within the scope of balloon specialised operations:

(a) special equipment is necessary to fulfil the task and which affects the behaviour of the balloon in flight;

(b) external loads are lifted; or

(c) persons enter or leave the balloon during flight.

AMC2 BOP.BAS.190 Balloon specialised operations — Risk assessment and checklist

DEVELOPMENT OF CHECKLIST

In order to develop a checklist, the pilot-in-command should take into account at least the following items:

(a) nature and complexity of the activity:

(1) the nature of the flight and risk exposure;

(2) the complexity of the activity taking into account the necessary pilot skills and level of experience, ground support, and individual protective equipment;

(3) the operational environment and geographical area; and

(4) the result of the risk assessment and evaluation;

(b) balloon and equipment:

all equipment required for the activity should be listed;

(c) crew members:

(1) crew composition;

(2) duties of crew members;

(3) minimum crew experience and training provisions; and

(4) recency provisions;

(d) normal, abnormal and emergency procedures:

(1) operating procedures for the flight crew; and

(2) ground procedures for crew members; and

(e) records:

it should be determined which records specific to the flight(s) are to be kept, such as task details, balloon registration, pilot-in-command, flight times, weather and any remarks, including a record of occurrences affecting flight safety or the safety of persons or property on the ground.

AMC3 BOP.BAS.190 Balloon specialised operations — Risk assessment and checklist

CHECKLIST FOR PARACHUTE OPERATIONS

The checklist for parachute operations should include:

(a) normal, abnormal and emergency procedures;

(b) relevant performance data;

(c) required equipment;

(d) any limitations such as maximum take-off mass and minimum landing mass; and

(e) responsibilities and duties of the pilot-in-command and, if applicable, of crew members.

GM1 BOP.BAS.190 Balloon specialised operations — Risk assessment and checklist

LIST OF OPERATIONS

(a) Balloon specialised operations include the following activities:

(1) parachute operations;

(2) hang-gliding dropping; and

(3) special events flights, including flying displays and competition flights.

(b) The following operations are not considered balloon specialised operations, but normal operations:

(1) aerial advertising flights; and

(2) news media flights, television and movie flights.

GM2 BOP.BAS.190 Balloon specialised operations — Risk assessment and checklist

CATEGORISATION OF OPERATIONS

The pilot-in-command or the operator determines whether the main purpose of an operation is passenger ballooning, commercial or not, or whether the activity falls within the scope of a balloon specialised operation. As regards a balloon specialised operation, the pilot-in-command or the operator applies the criteria in AMC1 BOP.BAS.190 and the activities listed in GM1 BOP.BAS.190.

SECTION 3 – PERFORMANCE AND OPERATING LIMITATIONS

BOP.BAS.200 Operating limitations

The pilot-in-command shall ensure that, during any phase of operation, the balloon is not exceeding any of the limitations set out in the AFM or equivalent document(s).

GM1 BOP.BAS.200 Operating limitations

GENERAL

In most cases the operating limitations are documented in the AFM, and in certain cases in the operations manual.

BOP.BAS.205 Weighing

(a) The weighing of the balloon shall be accomplished by the manufacturer of the balloon or in accordance with MCAR-Part-M.

(b) The operator shall ensure that the mass of the balloon has been established by actual weighing prior to its initial entry into service. The accumulated effects of modifications and repairs on the mass shall be accounted for and properly documented. Such information shall be made available to the pilot-in-command. The balloon shall be reweighed if the effects of modifications or repairs on the mass are not known.

GM1 BOP.BAS.205 Weighing

GENERAL

(a) New balloons that have been weighed at the factory may be placed into operation without reweighing if the mass records have been adjusted for alterations or modifications to the balloon. Balloons transferred from one EU operator to another EU operator do not have to be weighed prior to use by the receiving operator, unless the mass cannot be accurately established by calculation.

(b) The initial empty mass for a balloon is the balloon empty mass determined by a weighing performed by the manufacturer of the balloon before the initial entry into service.

(c) The mass of a balloon is revised whenever the cumulative changes to the balloon empty mass due to modifications or repairs exceed ± 10 % of the initial empty mass. This may be done by weighing the balloon or by calculation.

BOP.BAS.210 Performance — General

The pilot-in-command shall only operate the balloon if the performance of the balloon is adequate to comply with the requirements set out in the MCAR-Part-ROA and any other restrictions applicable to the flight, the airspace or operating sites used, ensuring that any charts or maps used are the latest available edition.

SECTION 4 – INSTRUMENTS AND EQUIPMENT

BOP.BAS.300 Instruments and equipment — General

(a) Instruments and equipment required by this Section shall be approved in accordance with MCAR-Part-21 if one of the following conditions is fulfilled:

(1) they are used to comply with points BOP.BAS.355 and BOP.BAS.360;

(2) they are permanently installed in the balloon.

(b) By way of derogation from point (a), all of the following instruments or equipment, when required by this Section, shall not need an approval:

(1) instruments or equipment used by the flight crew to determine the flight path;

(2) independent portable lights;

(3) an accurate time piece;

(4) first-aid kit;

(5) survival and signalling equipment;

(6) supplemental oxygen storage and dispensing apparatus;

(7) alternative source of ignition;

(8) fire blanket or fire-resistant cover;

(9) hand fire extinguisher;

(10) drop line;

(11) knife.

(c) Instruments and equipment not required by this Section, as well as any other equipment that is not required by this MCAR but is carried on board a balloon during a flight, shall comply with the following two conditions:

(1) the information provided by those instruments or equipment shall not be used by the flight crew to comply with the essential requirements for airworthiness set out in the Civil Aviation Regulations;

(2) the instruments and equipment shall not affect the airworthiness of the balloon, even in the case of failures or malfunction.

(d) Instruments and equipment shall be readily operable or accessible from the station where the flight crew member that needs to use it is assigned.

(e) All required emergency equipment shall be easily accessible for immediate use.

GM1 BOP.BAS.300(a) Instruments and equipment — General

APPLICABLE AIRWORTHINESS REQUIREMENTS

The applicable airworthiness requirements for the approval of instruments and equipment required by this MCAR are the following:

(a) MCAR-Part-21 for balloons registered in Mauritius; and

(b) airworthiness requirements of the State of registry for balloons registered outside Mauritius.

GM1 BOP.BAS.300(a)(2) Instruments and equipment - General

PERMANENTLY INSTALLED

'Permanently installed' means an instrument or equipment that requires a specific kind of installation to:

(a) perform its intended function;

(b) be operated according to its specified limitations; and

(c) minimise the hazards to the balloon in the event of a probable malfunction or failure.

GM1 BOP.BAS.300(b) Instruments and equipment — General

REQUIRED INSTRUMENTS AND EQUIPMENT THAT DO NOT NEED TO BE APPROVED

The functionality of non-installed instruments and equipment, required by this Subpart and that do not need an equipment approval, are checked against recognised industry standards appropriate to the intended purpose. The operator is responsible for ensuring the maintenance of these instruments and equipment.

GM1 BOP.BAS.300(c) Instruments and equipment — General

NOT REQUIRED INSTRUMENTS AND EQUIPMENT THAT DO NOT NEED TO BE APPROVED

(a) The provision of this paragraph does not exempt any installed instrument or item of equipment from complying with the applicable airworthiness requirements. In this case, the installation should be approved as required by the applicable airworthiness requirements and should comply with the applicable certification specifications.

(b) The failure of additional, non-installed instruments or equipment not required by this MCAR or by the applicable airworthiness requirements or any applicable airspace requirements should not adversely affect the airworthiness or the safe operation of the balloon.

BOP.BAS.305 Minimum instruments and equipment for flight

A balloon flight shall not be commenced when any of the instruments and equipment required for the intended flight with the balloon are missing, inoperative or do not fulfil the required functions.

AMC1 BOP.BAS.305 Minimum instruments and equipment for flight

GENERAL

Instruments and equipment that must be operative for all flights should be identified in a list. These instruments and equipment are:

(a) included in the type certification data sheet (TCDS) or the AFM; and

(b) required by the applicable implementing rules, such as operational and airspace requirements, and any other applicable requirements for the intended operation.

BOP.BAS.310 Operating lights

Balloons operated at night shall be equipped with all of the following:

(a) an anti-collision light;

(b) a means to provide adequate illumination for all instruments and equipment essential to the safe operation of the balloon;

(c) an independent portable light.

AMC1 BOP.BAS.310 Operating lights

ANTI-COLLISION LIGHTS AND ILLUMINATION FOR INSTRUMENTS AND EQUIPMENT

(a) An acceptable means of compliance for free manned balloons should be the anti-collision light required for VFR at night approved in accordance with CS-31HB/CS-31GB or with the applicable provisions for hot-air airships.

(b) A means of providing adequate illumination to instruments and equipment essential to the safe operation of the balloon may be an independent portable light.

BOP.BAS.315 Flight and navigational instruments and equipment

Balloons operated under VFR by day shall be equipped with both of the following:

(a) a means of displaying drift direction;

(b) a means of measuring and displaying:

(1) time in hours, minutes and seconds;

(2) vertical speed, if required by the AFM; and

(3) pressure altitude, if required by the AFM, when required by airspace requirements or when the altitude needs to be known for the use of oxygen.

AMC1 BOP.BAS.315(a) Flight and navigational instruments and associated equipment

MEANS OF DISPLAYING DRIFT DIRECTION

The drift direction may be determined by using a map and reference to visual landmarks.

AMC1 BOP.BAS.315(b)(1) Flight and navigational instruments and associated equipment

MEANS OF MEASURING AND DISPLAYING THE TIME

A means of measuring and displaying the time in hours, minutes and seconds may be a wristwatch capable of the same functions.

GM1 BOP.BAS.315(b)(3) Flight and navigational instruments and associated equipment

MEANS OF MEASURING AND DISPLAYING PRESSURE ALTITUDE

A means of measuring and displaying pressure altitude is needed when required by air traffic control or when altitude needs to be checked for flights where oxygen is used, or the limitations in the AFM require to limit altitude or rate of climb or descent.

BOP.BAS.320 Restraint systems

Balloons shall be equipped with a restraint system for the pilot-in-command when the balloon is equipped with one of the following:

(a) a separate compartment for the pilot-in-command;

(b) turning vent(s).

GM1 BOP.BAS.320 Restraint system

EQUIPMENT REQUIREMENTS

A pilot restraint harness mounted to the basket is considered to meet the requirements of CS-31HB/CS-31GB for a restraint system.

BOP.BAS.325 Supplemental oxygen

Balloons operated when an oxygen supply is required in accordance with point BOP.BAS.180 shall be equipped with oxygen storage and dispensing apparatus capable of storing and dispensing the required oxygen supplies.

BOP.BAS.330 First-aid kit

(a) Balloons shall be equipped with a first-aid kit.

(b) The first-aid kit shall be:

(1) readily accessible for use; and

(2) kept up-to-date.

AMC1 BOP.BAS.330 First-aid kit

CONTENT OF THE FIRST-AID KIT

(a) The first-aid kit should be equipped with appropriate and sufficient medications and instrumentation. However, the kit should be amended by the operator according to the characteristics of the operation (scope of operation, flight duration, number and demographics of passengers, etc.).

(b) The following should be included in the first-aid kit:

(1) bandages (assorted sizes);

(2) burns dressings (large and small);

(3) wound dressings (large and small);

(4) adhesive dressings (assorted sizes);

(5) antiseptic wound cleaner;

(6) safety scissors; and

(7) disposable gloves.

AMC2 BOP.BAS.330 First-aid kit

MAINTENANCE OF FIRST-AID KIT

To be kept up to date, the first-aid kit should be:

(a) inspected periodically to confirm, to the extent possible, that contents are maintained in the condition necessary for their intended use;

(b) replenished at regular intervals, in accordance with the instructions contained on their labels, or as circumstances warrant; and

(c) replenished after use in flight at the first opportunity where replacement items are available.

GM1 BOP.BAS.330(a) First-aid kit

ADDITIONAL FIRST-AID KIT

An additional first-aid kit may be carried in the retrieve vehicle or trailer.

BOP.BAS.335 Hand fire extinguishers

Except for gas balloons, balloons shall be equipped with at least one hand fire extinguisher.

AMC1 BOP.BAS.335 Hand fire extinguishers

CERTIFICATION SPECIFICATIONS

The applicable certification specification for hot-air balloons should be CS-31HB or equivalent.

GM1 BOP.BAS.335 Hand fire extinguishers

ADDITIONAL HAND FIRE EXTINGUISHER

An additional hand fire extinguisher may be carried in the retrieve vehicle or trailer.

BOP.BAS.340 Life-saving and signalling equipment – Flights over water

The pilot-in-command of a balloon operated over water shall determine, before commencing the flight, the risks to survival of the persons carried in the balloon in the

event of ditching. In light of those risks, he or she shall determine whether there is need to carry life-saving and signalling equipment.

AMC1 BOP.BAS.340 Life-saving and signalling equipment – Flights over water

RISK ASSESSMENT

In order to determine the risk, the pilot-in-command should take the following operating environment and conditions into account:

(a) water state;

(b) water and air temperatures;

(c) the distance from land suitable for making an emergency landing; and

(d) the availability of search and rescue facilities.

AMC2 BOP.BAS.340 Life-saving and signalling equipment – Flights over water

EQUIPMENT

Based on the risk assessment, the pilot-in-command should determine the carriage of:

(a) a life jacket or equivalent individual flotation device for each person on board that should:

(1) be worn or stowed in a position that is readily accessible from the station of the person for whose use it is provided; and

(2) be equipped with a means of electric illumination for the purpose of facilitating the location of persons;

(b) when carrying up to six persons, an emergency locator transmitter (ELT) or a personal locator beacon (PLB), carried by a crew member or a passenger, capable of transmitting simultaneously on 121.5 and 406 MHz;

(c) when carrying more than six persons, an ELT capable of transmitting simultaneously on 121.5 and 406 MHz; and

(d) signalling equipment for making distress signals.

AMC3 BOP.BAS.340 Life-saving and signalling equipment – Flights over water

BRIEFING ON PLB USE

When a PLB is carried by a passenger, he or she should be briefed on its characteristics and use by the pilot-in-command before the flight.

AMC4 BOP.BAS.340 Life-saving and signalling equipment – Flights over water

ELT AND PLB REGISTRATION AND OPERATION PROVISIONS

(a) Any ELT and PLB carried should be registered with the national authority responsible for initiating search and rescue, or another nominated authority.

(b) Any ELT carried should operate in accordance with the relevant provisions of Volume III of ICAO Annex 10 to the Chicago Convention, 'Aeronautical telecommunications'.

GM1 BOP.BAS.340 Life-saving and signalling equipment – Flights over water

TERMINOLOGY

(a) An ELT is a generic term describing equipment that broadcasts distinctive signals on designated frequencies and, depending on application, may be activated by impact or may be manually activated.

(b) A PLB is an emergency beacon, other than an ELT, that broadcasts distinctive signals at designated frequencies, is stand-alone, portable, and is manually activated by the survivors.

BOP.BAS.345 Life-saving and signalling equipment – Search and rescue difficulties

Balloons operated over areas in which search and rescue (SAR) would be especially difficult shall be equipped with such life-saving and signalling equipment as appropriate to the area overflown.

AMC1 BOP.BAS.345 Life-saving and signalling equipment – Search and rescue difficulties

GENERAL

Balloons operated across land areas in which search and rescue would be especially difficult should be equipped with the following:

(a) at least one ELT or a PLB;

(b) signalling equipment for making distress signals; and

(c) additional survival equipment adequate for the route to be flown taking account of the number of persons on board.

AMC2 BOP.BAS.345 Life-saving and signalling equipment – Search and rescue difficulties

ADDITIONAL SURVIVAL EQUIPMENT

(a) The following additional survival equipment should be carried:

(1) 500 ml of water for each four, or fraction of four, persons on board;

(2) one knife; and

(3) first-aid equipment.

(b) If any item of equipment in (a) is already carried on board in accordance with other requirements, the carriage does not need to be duplicated.

GM1 BOP.BAS.345 Life-saving and signalling equipment – Search and rescue difficulties

SIGNALS

The distress signals are described in Part VII of the fifteenth schedule of the Civil Aviation Regulations.

GM2 BOP.BAS.345 Life-saving and signalling equipment – Search and rescue difficulties

AREAS IN WHICH SEARCH AND RESCUE WOULD BE ESPECIALLY DIFFICULT

The expression ‘areas in which search and rescue would be especially difficult’ means:

(a) areas so designated by the authority responsible for managing search and rescue; or

(b) areas that are largely uninhabited and where the authority referred to in (a):

(1) has not published any information to confirm whether search and rescue would be or would not be especially difficult; and

(2) does not, as a matter of policy, designate areas as being especially difficult for search and rescue.

BOP.BAS.350 Miscellaneous equipment

(a) Balloons shall be equipped with protective gloves for each crew member.

(b) Mixed balloons, hot-air balloons and hot-air airships shall be equipped with all of the following:

(1) an alternative and independent source of ignition;

(2) a means of measuring and indicating fuel quantity;

(3) a fire blanket or fire-resistant cover;

(4) a drop line of at least 25 m in length.

(c) Gas balloons shall be equipped with both of the following:

(1) a knife;

(2) a trail rope of at least 20 m in length made of natural fibre or electrostatic, conductive material.

AMC1 BOP.BAS.350(b)(3) Miscellaneous equipment

FIRE BLANKET

A fire blanket should comply with the European Norm EN 1869 or equivalent. The size should be at least 1.5 m × 1.8 m. Smaller sizes are not recommended as they cannot sufficiently cover the source of developing propane fire.

AMC1 BOP.BAS.350(c)(1) Miscellaneous equipment

KNIFE

The knife, hook knife or equivalent, should be capable of cutting any control line or handling rope that is accessible to the pilot-in-command or a crew member from the basket.

BOP.BAS.355 Radio communication equipment

(a) Balloons shall have radio communication equipment to allow for the communication required in accordance with MCAR-Part-ROA and, if the flight takes place in the airspace of a third country, the law of that third country.

(b) The radio communication equipment shall provide for communication on the aeronautical emergency frequency 121,5 MHz.

GM1 BOP.BAS.355 Radio communication equipment

APPLICABLE AIRSPACE REQUIREMENTS

For balloons being operated under Mauritius air traffic control, the applicable airspace requirements include the airspace of the Republic of Mauritius.

BOP.BAS.360 Transponder

Balloons shall have a secondary surveillance radar (SSR) transponder with all the capabilities required in accordance with MCAR-Part-ROA and, if the flight takes places in airspace of a third country, the law of that third country.

AMC1 BOP.BAS.360 Transponder

GENERAL

(a) The secondary surveillance radar (SSR) transponders of balloons being operated under Mauritius air traffic control should comply with any applicable requirements of MCAR-Part-ROA.

(b) If the requirements of MCAR-Part-ROA is not applicable, the SSR transponders should operate in accordance with the relevant provisions of Volume IV of ICAO Annex 10 to the Chicago Convention, ‘Aeronautical telecommunications’.

SUBPART ADD — ADDITIONAL REQUIREMENTS FOR COMMERCIAL OPERATIONS

SECTION 1 – GENERAL ORGANISATION REQUIREMENTS

BOP.ADD.001 Scope

In accordance with the Civil Aviation Regulations, this Subpart establishes the requirements to be met, in addition to the requirements of Subpart BAS of this MCAR, by any operator engaged in commercial operations with balloons, other than the operators referred to in the Civil Aviation Regulations.

BOP.ADD.005 Responsibilities of the operator

(a) The operator shall be responsible for the operation of the balloon in accordance with the essential requirements set out in the Civil Aviation Regulations, with the requirements of this Subpart and with its declaration.

(b) Every flight shall be conducted in accordance with the provisions of the operations manual.

(c) The operator shall ensure that the balloon is equipped and all crew members are qualified as required for the area and type of operation.

(d) The operator shall ensure that all crew members assigned to, or directly involved in, flight operations comply with all of the following conditions:

(1) they are properly trained and instructed;

(2) they are aware of the rules and procedures relevant to their particular duties;

(3) they have demonstrated their abilities in their particular duties;

(4) they are aware of their responsibilities and the relationship of such duties to the operation of the balloon as a whole.

(e) The operator shall establish procedures and instructions for the safe operation of each balloon type, containing duties and responsibilities of the crew members, for all types of operations. Those procedures and instructions shall not require crew members to perform any activity during critical phases of flight other than those required for the safe operation of the balloon.

(f) The operator shall make arrangements for the supervision of crew members and personnel involved in the operation of the balloon by individuals with adequate experience and skills in order to ensure the attainment of the standards specified in the operations manual.

(g) The operator shall ensure that all crew members and personnel involved in the operation of the balloon are made aware that they are to comply with the laws, regulations and procedures of the States in which operations are conducted that are pertinent to the performance of their duties.

(h) The operator shall specify flight planning procedures to provide for the safe conduct of the flight, based on considerations of balloon performance, other operating limitations and relevant expected conditions on the route to be followed and at the operating sites concerned. Those procedures shall be included in the operations manual.

BOP.ADD.010 Notification of alternative means of compliance

The operator shall, when making the declaration in accordance with point BOP.ADD.100, notify to the Authority the list of alternative means of compliance (AltMoC), where it intends to use AltMoC to demonstrate compliance when so requested in accordance with point BOP.BAS.010. That list shall contain references to the acceptable means of compliance (AMC) which they replace in case associated AMC have been adopted by the Authority.

AMC1 BOP.ADD.010 Notification of alternative means of compliance

DEMONSTRATION OF COMPLIANCE

Whenever alternative means of compliance are used, a risk assessment should be completed and documented. The result of this risk assessment should demonstrate that an equivalent level of safety to that established by the AMC adopted by the Authority is reached.

BOP.ADD.015 Access

(a) For the purpose of determining compliance with the essential requirements set out in the Civil Aviation Regulations and with the requirements of this MCAR, the operator shall grant access to any person authorised by the Authority at any time to any facility, balloon, document, records, data, procedures or any other material relevant to the operator's activity that falls within the scope of this MCAR, irrespective of whether or not the activity is contracted.

(b) Access to the balloon shall, in the case of commercial passenger ballooning, include the possibility to enter and remain in the balloon during flight operations, unless to do so would endanger the flight.

BOP.ADD.020 Findings

After receipt of the notification of findings raised by the Authority in accordance with points ARO.GEN.350, ARO.GEN.355 and ARO.GEN.360 of MCAR-Part-ARO, the operator shall do all of the following:

(a) identify the root cause of the non-compliance;

(b) define a corrective action plan;

(c) demonstrate implementation of the corrective action plan to the satisfaction of the Authority within the time period specified by that authority in accordance with point ARO.GEN.350 of MCAR-Part-ARO.

AMC1 BOP.ADD.020(b) Findings

CORRECTIVE ACTION PLAN

The corrective action plan defined by the operator should address the effects of non-compliance, as well as its root cause.

GM1 BOP.ADD.020(b);(c) Findings

CORRECTIVE ACTION

'Corrective action' means the action to eliminate or mitigate the root cause(s) and prevent recurrence of an existing detected non-compliance or other undesirable condition or situation. Proper determination of the root cause(s) is crucial for defining effective corrective actions to prevent reoccurrence.

BOP.ADD.025 Occurrence reporting

(a) The operator shall implement, as part of its management system, an occurrence reporting scheme which is to provide for mandatory and voluntary reporting in accordance with the Civil Aviation Regulations.

(b) Without prejudice to point (a), the operator shall report to the Authority and to the organisation responsible for the design of the balloon any malfunction, technical defect, exceeding of technical limitations or occurrence that would highlight inaccurate, incomplete or ambiguous information contained in data established in accordance with MCAR-Part-21 and any other occurrence which constitutes an incident but not an accident or serious incident.

(c) The operator shall take the necessary measures to ensure compliance with the Civil Aviation Regulations, by the pilot-in-command, any other crew member and all its personnel in respect of any serious incident or accident associated with the operation of a balloon.

AMC1 BOP.ADD.025(a) Occurrence reporting

GENERAL

Additionally to reporting all occurrences required by the Civil Aviation Regulations , the operator should also report those specified in MCAR-Part-MOR .

BOP.ADD.030 Management system

(a) The operator shall establish, implement and maintain a management system that includes all of the following:

(1) clearly defined lines of responsibility and accountability throughout the organisation of the operator, including a direct safety accountability of the accountable manager;

(2) a description of the overall philosophies and principles of the operator with regard to safety, which shall be known as the safety policy;

(3) the identification of aviation safety hazards entailed by the activities of the operator, the evaluation of those hazards and the management of associated risks, including by taking actions to mitigate those risks where necessary and verifying the effectiveness of those actions;

(4) maintaining personnel trained and competent to perform their tasks;

(5) documentation of all key processes of the management system, including a process for making personnel aware of their responsibilities and the procedure for amending that documentation;

(6) a function to monitor compliance of the operator with the requirements of this MCAR. Such compliance monitoring shall include a feedback system of findings to the accountable manager of the operator to ensure effective implementation of corrective actions as necessary;

(7) the processes necessary to ensure compliance with the requirements of the Civil Aviation Regulations and its associated MCAR's.

(b) The management system shall correspond to the size of the operator and the nature and complexity of its activities, taking into account the hazards and associated risks of those activities.

AMC1 BOP.ADD.030(a)(2) Management system

SAFETY POLICY

The safety policy should include a commitment to improve towards the highest safety standards, comply with all applicable legal requirements, meet all applicable standards, consider best practices, and provide appropriate resources.

AMC1 BOP.ADD.030(a)(3) Management system

SAFETY RISK MANAGEMENT

Hazard identification and safety risk management should:

(a) be performed using internal safety or occurrence reports, hazard checklists, risk registers or similar risk management tools or processes, integrated into the activities of the operator;

(b) in particular address safety risks related to a change; by making use of the existing hazard identification, risk assessment and mitigation tools or processes; and

(c) include provisions for emergency response or a formal emergency response plan (ERP) to define the actions to be taken by the operator or specified individuals in an emergency.

GM1 BOP.ADD.030(a)(4) Management system

TRAINING ON SAFETY

The safety training programme may consist of self-instruction via the media (newsletters, flight safety magazines, etc), classroom training, e-learning or similar training provided by training service providers.

AMC1 BOP.ADD.030(a)(5) Management system

MANAGEMENT SYSTEM DOCUMENTATION

(a) The operator's management system documentation should at least include the following information:

(1) a statement signed by the accountable manager to confirm that the operator will continuously work in accordance with the applicable requirements and the operator's documentation, as required by this MCAR;

(2) the operator's scope of activities;

(3) the titles and names of persons referred to in BOP.ADD.040(a) and (c);

(4) an organisation chart showing the lines of responsibility among the persons referred to in BOP.ADD.040;

(5) a general description and location of the facilities referred to in BOP.ADD.045;

(6) procedures specifying how the operator ensures compliance with the applicable requirements;

(7) the amendment procedure for the operator's management system documentation.

(b) The operator's management system documentation may be included in a separate manual, or in (one of) the manual(s) required in this MCAR. A cross reference should be included.

AMC1 BOP.ADD.030(a)(6) Management system

COMPLIANCE MONITORING — AUDIT AND ORGANISATIONAL REVIEW

(a) Methodology

(1) The operator should accomplish the compliance monitoring by means of internal auditing.

(2) Notwithstanding (1), an operator with five or less full-time equivalents (FTEs), involved in the activity subject to this Subpart, may choose to accomplish compliance monitoring through an organisational review.

(b) General provisions for compliance monitoring

(1) The operator should specify the basic structure of the compliance monitoring function applicable to the activities conducted.

(2) The operator should ensure that personnel performing an audit or an organisational review, either internal to the operator or external, have relevant knowledge, background and experience as appropriate to the activities being audited or reviewed, including knowledge and experience in compliance monitoring.

(3) The operator should monitor compliance with the procedures it has designed to ensure safe activities. In doing so, the operator should as a minimum, and where appropriate, monitor compliance with:

(i) all activities for which the declaration is required;

(ii) manuals, logs and records;

(iii) training standards;

(iv) management system procedures; and

(v) standard operating procedures (SOPs).

(4) The operator should ensure that the status of all corrective and preventive actions is monitored and that these actions are implemented within a specified time frame. Action closure should be recorded along with a summary of the action taken.

(5) Based on the results of the audit or the organisational review, the accountable manager should determine the need for and initiate, as appropriate, further actions to address deficiencies or to further improve the operator's management system.

(c) Provisions, in addition to (b), for auditing

(1) The independence of the audit function should be ensured, in particular in cases where those performing the audit are also responsible for other functions for the operator.

(2) The operator should establish a compliance monitoring programme, defining a calendar for the audits to be performed. The frequency and depth of such audits should be determined with due regard to:

(i) the volume and complexity of operations;

(ii) results of the safety risk management processes;

(iii) results of past compliance monitoring;

(iv) findings raised by the Authority; and

(v) the scope of changes not requiring prior Authority approval.

(d) Provisions, in addition to (b), for the organisational review

(1) The organisational review should be performed at intervals not exceeding 12 months.

(2) As part of the management system documentation, the operator should describe the organisational review programme and related responsibilities.

(3) The organisational review programme may consist of:

(i) checklist(s) covering all items necessary to be addressed in order to demonstrate that the operator ensures effective compliance with the applicable requirements; and

(ii) a schedule for the accomplishment of the different checklist items, where each item should be checked at least at intervals not exceeding 12 months.

GM1 BOP.ADD.030(a)(6) Management system

COMPLIANCE MONITORING — AUDIT AND ORGANISATIONAL REVIEW

(a) 'audit' means a systematic, independent and documented process for obtaining evidence and evaluating it objectively to determine the extent to which requirements are complied with.

(b) 'organisational review' means a systematic and documented process for obtaining evidence and evaluating it to determine the extent to which requirements are complied with.

GM2 BOP.ADD.030(a)(6) Management system

COMPLIANCE MONITORING CHECKLIST

(a) Compliance monitoring audits or organisational reviews may be documented using a compliance monitoring checklist. The following provides a basic checklist, to be adapted as necessary to address the particular type of operations and to cover all relevant procedures described in the management system documentation and operations manual.

(b) Each checklist item may be addressed using an appropriate combination of:

(1) review of records and documentation;

(2) interview of the personnel involved; and

(3) feedback provided by contractors.

COMPLIANCE MONITORING CHECKLIST Year:			
Subject	Date checked	Checked by	Comments/non-compliance Report No
Declaration change management			
Operations have been performed in accordance with the declaration			
Changes have been properly managed in accordance with the defined process			
Flight operations			
Balloon checklists checked for accuracy and validity			
Flight plans checked for proper and correct information			
Ground handling			
Instructions regarding fuelling, if applicable			
Instructions regarding dangerous goods issued and known by all relevant personnel, if applicable			
Mass			
Load sheets checked for proper and correct information, if applicable			
Pilot training			
Updated and accurate training records			
Pilot licences current, correct ratings and valid medical certificates			
Pilots received recurrent training			
Training facilities and instructors approved			
Pilots received pre-flight inspection training, as applicable			
Documentation related to operations			

Operations manual checked for correct amendment status			
Flight documents record checked and updated			
Personnel			
Correctly identified current accountable manager and other nominated persons			
The organisation chart accurately indicates lines of responsibility and accountability throughout the organisation			
Qualifications of all new personnel (or personnel with new functions) have been appropriately assessed			
Proper training has been provided to staff involved in any safety-management-related processes and tasks			
Proper training has been provided to staff involved in any compliance-monitoring-related processes and tasks			
Training provided to staff, as necessary, to cover changes in regulations, in Authority publications, in the management system documentation and in associated procedures, etc.			
Contracted activities (if applicable)			
Assessment of any new providers prior to the establishment of any contract			
For existing providers: check that the service provided conforms to the applicable requirements of this MCAR			
Training and communication on safety			
All personnel are aware of safety management policies, processes and tasks			
Availability of safety-related documentation and publications			
Safety-critical information derived from internal safety or occurrence reporting, hazard identification or compliance monitoring have been timely communicated to all staff concerned			
Management system documentation			
Adequate and updated documentation			
Staff can easily access such documentation when needed			
Record-keeping			
The records cover all the activities and management system processes			
Compliance with minimum record-keeping periods (random checks)			
Emergency response provisions or emergency response plan (ERP)			

Emergency response information or ERP, as applicable, is up to date and readily available			
All staff is aware of the emergency response information or ERP (random checks)			
If an ERP has been activated, how effective was it?			
Internal safety reporting procedures			
Check the number of reports received since the last audit or organisational review			
Internal reporting and external occurrence reporting are properly performed			
The safety or occurrence reports are analysed			
Feedback is provided to reporters			

BOP.ADD.035 Contracted activities

When contracting any part of its activity that falls within the scope of this MCAR, the operator shall be responsible for ensuring that the contracted organisation carries out the activity in accordance with the essential requirements set out in the Civil Aviation Regulations and with the requirements of this MCAR. The operator shall also ensure that the Authority is given access to the contracted organisation in order to determine that the operator complies with those requirements.

AMC1 BOP.ADD.035 Contracted activities

RESPONSIBILITY WHEN CONTRACTING ACTIVITIES

(a) The operator may decide to contract certain activities to external organisations.

(b) A written agreement should exist between the operator and the contracted organisation clearly defining the contracted activities and the applicable requirements.

(c) The contracted, safety-related activities relevant to the agreement should be included in the operator's safety management and compliance monitoring programmes.

(d) The operator should ensure that the contracted organisation has the necessary resources and competence to undertake the task.

GM1 BOP.ADD.035 Contracted activities

CONTRACTING — GENERAL

(a) Operators may decide to contract certain activities to external organisations for the provision of services related to areas such as:

(1) ground handling;

(2) flight support;

(3) training; and

(4) manual preparation.

(b) Contracted activities include all activities that are performed by another organisation either itself declared or certified to carry out such activities or, if not declared or certified, working under the operator's declaration.

(c) The ultimate responsibility for the product or service provided by external organisations always remains with the operator.

GM2 BOP.ADD.035 Contracted activities

RESPONSIBILITY WHEN CONTRACTING ACTIVITIES

(a) Regardless of the status of the contracted organisation, the contracting operator is responsible for ensuring that all contracted activities are subject to hazard identification and risk management as required by BOP.ADD.030(a)(3), and to compliance monitoring as required by BOP.ADD.030(a)(6).

(b) When the contracted organisation is itself declared or certified to carry out the contracted activities, the operator's compliance monitoring at least checks that the declaration effectively covers the contracted activities.

BOP.ADD.040 Personnel requirements

(a) The operator shall appoint an accountable manager who has the authority to ensure that all activities that fall within the scope of this MCAR can be financed and carried out in accordance with the essential requirements set out in the Civil Aviation Regulations and with the requirements of this MCAR. The accountable manager shall be responsible for establishing and maintaining an effective management system.

(b) The operator shall:

(1) identify the responsibilities of its personnel for all tasks and activities to be performed;

(2) have sufficient qualified personnel to carry out those tasks and activities; and

(3) maintain appropriate experience, qualification and training records of its personnel.

(c) The operator shall nominate one or more persons responsible for the management and supervision of all of the following areas:

(1) flight operations;

(2) ground operations;

(3) continuing airworthiness, in accordance with MCAR-Part-M.

GM1 BOP.ADD.040 Personnel requirements

SMALLEST OPERATOR

The smallest operator that can be considered is the one-person operator where all of the nominated posts are filled by the accountable manager.

AMC1 BOP.ADD.040(c) Personnel requirements

NOMINATED PERSONS

(a) A description of the functions and the responsibilities of the nominated persons, including their names, should be contained in the operations manual.

(b) The operator should make arrangements to ensure continuity of supervision in the absence of nominated persons.

(c) A person nominated by the operator, who has already been nominated by another operator, may be acceptable subject to the agreement of the competent authorities concerned.

(d) Nominated persons should work sufficient hours to fulfil the management functions associated with the scale and scope of the operation.

(e) One person may hold more than one of the nominated posts if such an arrangement is considered suitable and properly matched to the scale and scope of the operation.

(f) The acceptability of a single person holding several posts, possibly in combination with being the accountable manager, should depend upon the nature and scale of the operation. The two main areas of concern should be competence and the individual's capacity to meet his or her responsibilities.

(g) As regards competence in different areas of responsibility, there should not be any difference from the requirements applicable to persons holding only one post.

(h) The capacity of an individual to meet his or her responsibilities should primarily be dependent upon the scale of the operation. However, the complexity of the organisation or of the operation may prevent, or limit, combinations of posts which may be acceptable in other circumstances.

GM1 BOP.ADD.040(c) Personnel requirements

COMPETENCE OF NOMINATED PERSONS

(a) Nominated persons in accordance with BOP.ADD.040 possess the experience and meet the licensing provisions that are listed below in (b) to (e). Exceptionally, in particular cases, the Authority may accept a nomination that does not meet these provisions in full. In that case, the nominee has comparable experience and also the ability to perform effectively the functions associated with the post and with the scale of the operation.

(b) Nominated persons have:

(1) practical experience and expertise in the application of aviation safety standards and safe operating practices;

(2) comprehensive knowledge of:

(i) the applicable safety regulations in Mauritius and any associated requirements and procedures; and

(ii) the need for, and content of, the relevant parts of the operations manual; and

(3) 3 years of relevant work experience.

(c) Flight operations

The nominated person:

(1) holds or has held a valid flight crew licence and the associated ratings appropriate to the relevant type of operation; or

(2) has demonstrated in another manner thorough knowledge of the relevant flight operations.

(d) Ground operations

The nominated person has a thorough knowledge of the operator's ground operations concept.

(e) Continuing airworthiness

The nominated person has the relevant knowledge and meets the appropriate experience requirements related to balloon continuing airworthiness as detailed in MCAR-Part-M.

BOP.ADD.045 Facility requirements

The operator shall have facilities that are sufficient to allow the performance and management of all tasks and activities required to ensure compliance with the essential requirements set out in the Civil Aviation Regulations and with the requirements of this MCAR.

SECTION 2 – DECLARATION, AIRWORTHINESS AND WET AND DRY LEASE

BOP.ADD.100 Declaration

(a) In the declaration referred to in the second subparagraph of Article 3(2), the operator shall confirm that it complies and will continue to comply with the essential requirements set out in the Civil Aviation Regulations and with the requirements of this MCAR.

(b) The operator shall include in the declaration all of the following information:

(1) the name of the operator;

(2) the place where the operator has its principal place of business;

(3) the name and contact details of the accountable manager of the operator;

(4) the starting date of the commercial operation and, where relevant, the date at which the change to an existing commercial operation takes effect;

(5) in respect of all balloons used for the commercial operation, the balloon type, registration, main base, type of operation and continuing airworthiness management organisation.

(c) Where applicable, the operator shall annex to the declaration the list of alternative means of compliance (AltMoC), in accordance with point BOP.ADD.010.

(d) When making the declaration, the operator shall use the form contained in the Appendix to this Part-BOP.

GM1 BOP.ADD.100 Declaration

GENERAL

The intent of the declaration is to:

(a) have the operator acknowledge its responsibilities under the applicable safety regulations and that it holds all necessary approvals;

(b) inform the Authority of the existence of an operator; and

(c) enable the Authority to fulfil its oversight responsibilities.

BOP.ADD.105 Changes to the declaration and cessation of commercial operations

(a) The operator shall notify the Authority without delay of any changes in circumstances affecting its compliance with the essential requirements set out in the Civil Aviation Regulations and with the requirements of this MCAR, as declared to the Authority, and of any changes in respect of the information referred to in point BOP.ADD.100(b) and the list of AltMoCs referred to in point BOP.ADD.100(c), as included in or annexed to the declaration.

(b) The operator shall notify the Authority without delay when it is no longer engaged in commercial operations with balloons.

AMC1 BOP.ADD.105(a) Changes to the declaration and cessation of commercial operations

NOTIFICATION OF CHANGES

The new declaration should be submitted before the change becomes effective, indicating the date as of which the change would apply.

BOP.ADD.110 Airworthiness requirements

Balloons shall have a certificate of airworthiness issued in accordance with MCAR-Part-21 or, in the case of a balloon registered in a third country, shall be subject to either a wet lease agreement or a dry lease agreement in accordance with point BOP.ADD.115.

BOP.ADD.115 Wet lease and dry lease of a balloon registered in a third country

(a) The operator shall notify to the Authority any wet lease agreement or dry lease agreement concerning a balloon registered in a third country.

(b) Where a balloon registered in a third country is subject to a wet lease agreement, the operator shall ensure that the level of safety resulting from the application of the safety standards with regard to continuing airworthiness and air operations to which the third country operator of the balloon is subject, is at least equivalent to that resulting from the application of the requirements of MCAR-Part-M and of this MCAR.

(c) Where a balloon registered in a third country is subject to a dry lease agreement, the operator of such balloon shall ensure compliance with the essential requirements relating to continuing airworthiness set out in the Civil Aviation Regulations and with the requirements of this MCAR.

AMC1 BOP.ADD.115 Wet lease and dry lease of a balloon registered in a third country

GENERAL

(a) The operator intending to lease-in a third-country balloon should provide the Authority with the following information:

(1) the name and address of the registered owner;

(2) a copy of the valid certificate of airworthiness;

(3) a copy of the lease agreement or description of the lease provisions, except financial arrangements; and

(4) duration of the lease.

(b) The information mentioned above should be accompanied by a statement signed by the lessee that the parties to the lease agreement fully understand their respective responsibilities under the applicable regulations.

GM1 BOP.ADD.115(a) Wet lease and dry lease of a balloon registered in Mauritius

LEASE-IN AGREEMENT BETWEEN OPERATORS REGISTERED IN MAURITIUS

The lessee notifies to the Authority any lease agreement between operators having their principal place of business in Mauritius.

SECTION 3 – MANUALS AND RECORDS

BOP.ADD.200 Operations manual

(a) The operator shall establish an operations manual.

(b) The content of the operations manual shall reflect the requirements set out in this MCAR and shall not contravene any information contained in the operator's declaration.

(c) The operations manual may be established as separate parts.

(d) All personnel of the operator shall have easy access to the portions of the operations manual that are relevant to their duties.

(e) The operations manual shall be kept up-to-date. All personnel of the operator shall be made aware of any amendment of the operations manual that are relevant to the performance of their duties.

(f) The operator shall ensure that any information used as the basis for the content of the operations manual and any amendment thereof is correctly reflected in the operations manual.

(g) The operator shall ensure that all personnel are able to understand the language in which those parts of the operations manual which are relevant to their duties are written. The content of the operations manual shall be presented in a form that can be used without difficulty.

AMC1 BOP.ADD.200 Operations manual

GENERAL

(a) The operations manual may vary in detail according to the complexity of the operation and of the type of balloons operated.

(b) The operations manual, or parts thereof, may be presented in any form, including electronic form. In all cases, the accessibility, usability and reliability should be assured.

(c) The operations manual should be such that:

(1) all its parts are consistent and compatible in form and content;

(2) it can be easily amended; and

(3) its content and amendment status is controlled and clearly indicated.

(d) The operations manual should include a description of its amendment and revision process specifying:

(1) the person(s) who may approve amendments or revisions;

(2) the conditions for amendments and revisions; and

(3) the methods by which operator personnel are advised of the changes.

(e) The operations manual content may be based on, or may refer to, industry codes of practice.

(f) When compiling an operations manual, the operator may take advantage of the contents of other relevant documents. Material produced by the operator for the type-related part of the operations manual may be supplemented with, or substituted by, applicable parts of the AFM or, where such a document exists, by an operating manual produced by the manufacturer of the balloon.

(g) If the operator chooses to use material from another source in the operations manual, either the applicable material should be copied and included directly in the relevant part of the operations manual, or the operations manual should contain a reference to the appropriate section of that applicable material. In the latter case the operator should make available the applicable material to the personnel.

(h) If the operator chooses to make use of material from another source (e.g. a route manual producer, a balloon manufacturer or a training organisation), this does not absolve the operator from the responsibility of verifying the applicability and suitability of this material. Any material received from an external source should be given its status by a statement in the operations manual.

AMC2 BOP.ADD.200 Operations manual

CONTENT

The operations manual should include the following information, as relevant for the area and the type of operation:

(a) table of contents;

(b) amendment control status and list of effective pages or paragraphs, unless the entire manual is reissued and the manual has an effective date on it;

(c) duties, responsibilities, and succession of management and operating personnel;

(d) description of the management system;

(e) flight time limitations;

(f) standard operating procedures;

(g) weather limitations;

(h) emergency procedures;

(i) accident and incident considerations;

(j) personnel qualifications and training;

(k) record-keeping;

(l) normal flight operations;

(m) performance operating limitations; and

(n) handling of dangerous goods, if applicable.

GM1 BOP.ADD.200 Operations manual

MORE CONSERVATIVE DATA AND PROCEDURES

The operator may decide to publish data and procedures in the operations manual which are more conservative.

BOP.ADD.205 Record-keeping

(a) The operator shall establish a system of record-keeping that allows adequate storage and reliable traceability of its activities.

(b) The format of the records shall be specified in the operator's procedures or manuals.

AMC1 BOP.ADD.205 Record-keeping

GENERAL

(a) The record-keeping system should ensure that all records are accessible whenever needed within a reasonable time. These records should be organised in a way that ensures traceability and retrievability throughout the required retention period.

(b) Records should be kept in paper form or in electronic format or a combination of both. Records stored on microfilm or optical disc format are also acceptable. The records should remain legible throughout the required retention period. The retention period starts when the record has been created or last amended.

(c) Paper systems should use robust material which can withstand normal handling and filing. Computer systems should have at least one backup system which should be updated within 24 hours of any new entry. Computer systems should include safeguards against the ability of unauthorised personnel to alter the data.

(d) All computer hardware used to ensure data backup should be stored in a different location from that containing the working data and in an environment that ensures they remain in good condition. When hardware or software changes take place, special care should be taken that all necessary data remains accessible at least through the full retention period.

AMC2 BOP.ADD.205 Record-keeping

STORAGE PERIODS AND AVAILABILITY

(a) The following records should be stored for at least 5 years:

(1) records of the activities referred to in BOP.ADD.030;

(2) a copy of the operator's declaration;

(3) details of approvals held; and

(4) operations manual.

(b) The following information used for the preparation and execution of a flight, and associated reports, should be stored for 3 months:

(1) the operational flight plan, if applicable;

(2) mass documentation;

(3) notification of special loads, including written information to the pilot-in-command about dangerous goods, if applicable; and

(4) flight report(s) for recording details of any occurrence, or any event that the pilot-in-command deems necessary to report or record.

(c) Flight crew records should be stored for the periods indicated below:

Flight crew licence	As long as the crew member is exercising the privileges of the licence for the balloon operator
Flight crew member training, checking and qualifications	3 years
Records on flight crew member recent experience	15 months

(d) The operator should make such records available, on request, to the crew member concerned.

(e) The operator should preserve the information used for the preparation and execution of a flight and personnel training records, even if the operator ceases to be the operator of that balloon or the employer of that crew member, provided this is within the timescales prescribed in (c).

(f) If a crew member becomes a crew member for another operator, the former operator should make the crew member's records available to the new operator, provided this is within the timescales prescribed in (c).

(g) A summary of training should be maintained by the operator to show every crew member's completion of each stage of training and checking.

SECTION 4 – FLIGHT CREW

BOP.ADD.300 Composition of flight crew

(a) The composition of the flight crew shall be, as a minimum, as specified in the AFM or operating limitations prescribed for the balloon.

(b) The flight crew shall include additional flight crew members when required by the type of operation. The number of the flight crew shall not be lower than the number specified in the operations manual.

(c) All flight crew members shall hold a licence and ratings issued or accepted in accordance with Part-BFCL to this MCAR and shall be appropriate to the duties assigned to them.

(d) Flight crew members may be relieved during the flight of their duties at the controls by another suitably qualified flight crew member.

(e) When engaging the services of flight crew members who work on a freelance or part-time basis, the operator shall verify that all of the following requirements are complied with:

(1) the requirements of this Subpart;

(2) Part-BFCL to this MCAR, including the requirements on recent experience;

(3) the flight and duty time limitations and rest requirements in accordance with the law of Mauritius where the operator has its principal place of business, taking into account all services rendered by the flight crew member to other operators.

BOP.ADD.305 Designation as pilot-in-command

(a) The operator shall designate one pilot amongst the flight crew as pilot-in-command.

(b) The operator shall only designate a pilot to act as pilot-in-command if he or she:

(1) is qualified to act as pilot-in-command in accordance with Part-BFCL to this MCAR;

(2) has the minimum level of experience specified in the operations manual; and

(3) has adequate knowledge of the area to be flown.

BOP.ADD.310 Provision of training and checking

All training and checking of flight crew members required pursuant to point BOP.ADD.315 shall be provided as follows:

(a) in accordance with the training programmes and syllabi established by the operator in the operations manual;

(b) by appropriately qualified persons and, as regards flight training and checking, by persons qualified in accordance with Part-BFCL to this MCAR.

AMC1 BOP.ADD.310(a) Provision of training and checking

ADDITIONAL TRAINING FOR THE PILOT-IN-COMMAND

The pilot-in-command should complete training in first-aid and in the use of the fire extinguisher, at intervals of maximum 36 months.

BOP.ADD.315 Recurrent training and checking

(a) Each flight crew member shall complete every 2 years recurrent flight and ground training relevant to the class of balloon on which he or she operates, including training on the location and use of all emergency and safety equipment carried.

(b) Each flight crew member shall complete operator proficiency checks to demonstrate his or her competence in carrying out normal, abnormal and emergency procedures, covering the relevant aspects associated with the specialised tasks described in the operations manual. When carrying out those checks, due account shall be taken of crew members who undertake operations under VFR at night.

(c) The operator proficiency check shall be valid for 24 calendar months, counting from the end of the month during which the check was carried out or, in case the check is carried out within the last 3 months of the validity period of the previous check, from the last day of the validity period of that previous check.

AMC1 BOP.ADD.315(b);(c) Recurrent training and checking

PROFICIENCY CHECK

The operator proficiency check should be conducted by an examiner.

SECTION 5 – GENERAL OPERATING REQUIREMENTS

BOP.ADD.400 Responsibilities of the pilot-in-command

The pilot-in-command shall comply with both of the following:

(a) the relevant requirements of the operator's occurrence reporting scheme referred to in point BOP.ADD.025;

(b) all flight and duty time limitations and rest requirements applicable to his or her activities in accordance with the law of Mauritius where the operator has its principal place of business.

BOP.ADD.405 Authority of the pilot-in-command

Notwithstanding point BOP.BAS.035, the operator shall take all reasonable measures to ensure that all persons carried in the balloon obey all lawful commands given by the pilot-in-command for the purpose of ensuring the safety of the balloon, of any person or property carried therein or of any person or property on the ground.

BOP.ADD.410 Additional balloon crew member

When a balloon carries more than 19 passengers, at least one additional crew member shall be present on board the balloon in addition to the flight crew as required pursuant to points (a) and (b) of point BOP.ADD.300 to assist passengers in the event of an emergency. That additional crew member shall be appropriately experienced and trained.

AMC1 BOP.ADD.410 Additional balloon crew member

TRAINING AND RECENCY

(a) For training, the additional crew member should have participated in:

(1) three practical training inflations with subsequent flights on a balloon with a basket of a capacity of more than 19 passengers;

(2) at least one landing under (1) with a ground speed of at least 8 kt; and

(3) training in first-aid and in the use of the fire extinguisher, at intervals of maximum 36 months.

(b) For recency, the additional crew member should perform at least 2 flights in this function in any 12-month period. Otherwise, he or she should, before resuming as additional crew member, fulfil again the training requirements of points (a)(1) and (a)(2).

BOP.ADD.415 Fitness relating to deep water diving and blood donation

Crew members shall not perform any duties on the balloon where their fitness might be impaired after deep water diving or following blood donation.

GM1 BOP.ADD.415 Fitness relating to deep water diving and blood donation

ELAPSED TIME BEFORE RETURNING TO FLYING DUTY

24 hours is a suitable minimum length of time to allow after normal recreational (sport) diving or normal blood donation before a flight. This is considered by operators when determining a reasonable time period for the guidance of crew members.

BOP.ADD.420 Common language

The operator shall ensure that all crew members can communicate with each other in a common language.

BOP.ADD.425 Psychoactive substances

The operator shall take all reasonable measures to ensure that no person enters or is in a balloon when under the influence of psychoactive substances to the extent that the safety of the balloon, of any person or property carried therein or of any person or property on the ground is likely to be endangered by the presence of that person.

BOP.ADD.430 Endangering

The operator shall take all reasonable measures to ensure that no person, intentionally, recklessly or negligently, acts or omits to act with one of the following consequences:

(a) endanger a balloon or person therein or on the ground;

(b) cause or permit a balloon to endanger any person or property.

BOP.ADD.435 Documents, manuals and information to be carried

(a) All of the following documents, manuals and information shall be carried on each flight as originals or copies:

(1) the declaration made by the operator;

(2) information concerning search and rescue services for the area of the intended flight;

(3) the operational flight plan.

(b) All of the following documents, manuals and information shall be stowed at a safe place, not on board the balloon during a flight, as originals:

(1) the documents, manuals and information referred to in point (a), when copies thereof are carried on board the balloon during a flight;

(2) the current parts of the operations manual or the standard operating procedures (SOPs) that are relevant to the duties of crew members, which shall be easily accessible to them;

(3) passenger lists, when passengers are carried;

(4) the mass documentation referred to in point (c) of point BOP.ADD.600.

(c) When requested by the Authority, the pilot-in-command or the operator shall make available to that authority the original documents, manuals and information within the time period specified by the authority which shall not be less than 24 hours.

GM1 BOP.ADD.435(a)(2) Documents, manuals and information to be carried

SEARCH AND RESCUE INFORMATION

This information is usually found in the State's aeronautical information publication.

GM1 BOP.ADD.435(a)(3) Documents, manuals and information to be carried

OPERATIONAL FLIGHT PLAN

(a) The operational flight plan used and the entries made may contain the following items:

(1) balloon registration;

(2) date of flight;

(3) name of the pilot-in-command;

(4) place of departure;

(5) time of departure;

(6) type of operation

(7) balloon type;

(8) balloon size;

(9) balloon empty mass;

(10) mass of the traffic load;

(11) mass of the fuel or ballast load;

(12) take-off mass;

(13) fuel or ballast calculation;

(14) relevant meteorological information; and

(15) special risk factors (e.g. power lines, wind turbines, airspace classification, etc.).

(b) Items that are readily available in other documentation or from another acceptable source or are irrelevant to the type of operation may be omitted from the operational flight plan.

BOP.ADD.440 Dangerous goods

The operator shall:

(a) establish procedures to ensure that all reasonable measures are taken to prevent dangerous goods from being carried on board the balloon inadvertently; and

(b) provide crew members with the necessary information enabling them to adequately carry out their duties in respect of any dangerous goods carried or intended to be carried on board the balloon.

GM1 BOP.ADD.440 Dangerous goods

PROCEDURES AND INFORMATION TO CREW MEMBERS AND PASSENGERS

(a) The operator provides information in the operations manual to enable the pilot-in-command and other crew members to identify which dangerous goods may be permitted on board.

(b) Information should be given to the passengers as regards goods that are prohibited to take on board before the flight takes place. The crew may provide this information in a briefing before the flight.

(c) Procedures are established and described in the operations manual to respond to accidents or incidents involving dangerous goods. The relevant crew members are familiar with these procedures.

SECTION 6 – OPERATING PROCEDURES

BOP.ADD.500 Fuel or ballast calculations

The operator shall ensure that the calculations as regards reserve fuel or ballast are documented in an operational flight plan.

BOP.ADD.505 Carriage of special categories of passengers

The operator shall establish procedures for carrying persons requiring special conditions, assistance or devices when carried on board a balloon under conditions that ensure the safety of the balloon and of any person or property carried therein.

BOP.ADD.510 Commercial balloon specialised operations — Standard operating procedures

Notwithstanding point BOP.BAS.190:

(a) Before commencing a commercial balloon specialised operation, the operator shall conduct a risk assessment, assessing the complexity of the intended operation in order to determine the hazards and associated risks of the operation and to establish mitigating measures where necessary.

(b) Based on the risk assessment, the operator shall, before commencing the commercial balloon specialised operation, establish standard operating procedures (SOPs) appropriate to the intended operation and the balloon used. The SOPs shall either be part of the operations manual or be laid down in a separate document. The operator shall regularly review and update the SOPs where necessary in order to adequately take account of the risk assessment.

(c) The operator shall ensure that commercial balloon specialised operations are performed in accordance with the SOPs.

AMC1 BOP.ADD.510 Commercial balloon specialised operations — Standard operating procedures

DEVELOPMENT OF STANDARD OPERATING PROCEDURES

(a) Standard operating procedures (SOPs) should be developed to a standard format in accordance with AMC2 BOP.ADD.510 and should take into account the results of the risk assessment process.

(b) SOPs should be based on a systematic risk assessment to ensure that the risks associated with the task are acceptable. The risk assessment should describe the activity in detail, identify the relevant hazards, analyse the causes and

consequences of accidental events, and establish methods to treat the associated risk.

AMC2 BOP.ADD.510 Commercial balloon specialised operations — Standard operating procedures

TEMPLATE

(a) Nature and complexity of the activity

(1) The nature of the activity and exposure. The nature of the flight and the risk exposure should be described.

(2) The complexity of the activity. Details should be provided on how demanding the activity is with regard to the required piloting skills, the necessary level of experience, the ground support, safety and individual protective equipment that should be provided to persons involved.

(3) The operational environment and geographical area. The operational environment and geographical area over which the operation takes place should be described:

(i) congested hostile environment: balloon performance standard, compliance with rules of the air, mitigation of third-party risk;

(ii) mountain areas: altitude, performance, the use or non-use of oxygen with mitigating procedures;

(iii) water areas: water state and temperature, risk of ditching, availability of search and rescue, survivability, carriage of safety equipment;

(iv) desert areas: carriage of safety equipment, reporting procedures, search and rescue information; and

(v) other areas.

(b) Equipment

All equipment required for the activity should be listed. This includes installed equipment certified in accordance with MCAR-Part-21 as well as equipment approved in accordance with other, officially recognised standards.

(c) Crew members

(1) The crew composition and their duties should be specified.

(2) In addition, for flight crew members, the following should be specified:

(i) selection criteria (initial qualification, flight experience, experience in the activity);

(ii) initial training (volume and content of the training); and

(iii) recent experience requirement and recurrent training (volume and content of the training).

(3) The criteria listed in (2) should take into account the operational environment and the complexity of the activity, and should be detailed in the training programmes.

(d) Performance

Details on applicable, specific performance requirements should be provided.

(e) Normal, abnormal and emergency procedures

The normal, abnormal and emergency procedures to be applied in flight and on the ground should be described.

(f) Ground equipment

Details on the nature, number and location of ground equipment required for the activity should be provided.

(g) Records

It should be determined which records specific to the flight(s) are to be kept, such as task details, balloon registration, pilot-in-command, flight times, weather and any remarks, including a record of occurrences affecting flight safety or the safety of persons or property on the ground.

SECTION 7 – PERFORMANCE AND OPERATING LIMITATIONS

BOP.ADD.600 System for determining the mass

(a) The operator shall establish a system specifying how all of the following items are accurately determined for each flight, so as to enable the pilot-in-command to verify that the limitations of the AFM are complied with:

(1) balloon empty mass;

(2) mass of the traffic load;

(3) mass of the fuel or ballast load;

(4) take-off mass;

(5) loading of the balloon performed under the supervision of the pilot-in-command or qualified personnel;

(6) preparation and disposition of all documentation.

(b) The mass computation based on electronic calculations shall be replicable by the pilot-in-command.

(c) The mass documentation, specifying the items listed in point (a), shall be prepared prior to each flight and documented in an operational flight plan.

AMC1 BOP.ADD.600(a)(2) System for determining the mass

TRAFFIC LOAD, AND MASS VALUES FOR PASSENGERS AND BAGGAGE

(a) Traffic load should be determined by actual weighing, or by calculating masses for passengers, persons other than flight crew members and baggage as follows:

(1) Passenger mass may be calculated on the basis of a statement by, or on behalf of, each passenger, adding to it a predetermined mass to account for hand baggage and clothing.

(2) The predetermined mass for hand baggage and clothing should be established by the operator on the basis of experience relevant to its particular operation. In any case, it should not be less than:

(i) 4 kg for clothing; and

(ii) 3 kg for hand baggage.

(b) The passengers' stated mass, the mass of passengers' clothing and hand baggage should be checked prior to boarding and adjusted, if necessary.

(c) When determining the actual mass by weighing, passengers' personal belongings and hand baggage should be included.

AMC1 BOP.ADD.600(a)(6) System for determining the mass

DOCUMENTATION

(a) Mass documentation should include the following:

(1) balloon registration and type;

(2) date and flight identification;

(3) name of the pilot-in-command;

(4) name of the person who prepared the document;

(5) empty mass;

(6) mass of the fuel or ballast at take-off;

(7) load components including passengers, baggage and, if applicable, freight;

(8) maximum take-off mass allowed by the AFM according to temperature and altitude; and

(9) limiting mass values.

(b) The mass documentation should enable the pilot-in-command to determine that the load is within the mass limits of the balloon.

(c) The information above may be available in flight planning documents, or other documents readily available for use, or mass systems.

(d) Any last-minute change should be brought to the attention of the pilot-in-command and entered in the documents containing the mass information. The operator should specify the maximum last-minute change allowed in passenger numbers. New mass documentation should be prepared if this maximum number is exceeded.

(e) Where mass documentation is generated by a computerised mass system, the operator should verify the integrity of the output data at intervals not exceeding 6 months.

(f) A copy of the final mass documentation should be made available to the pilot-in-command for his or her acceptance.

GM1 BOP.ADD.600(a)(6) System for determining the mass

LIMITING MASS VALUES

The limiting mass values contained in the mass documentation are those stipulated in the AFM.

Appendix

DECLARATION in accordance with the Civil Aviation Regulations				
Operator Name: Place where the operator has its principal place of business: Name and contact details of the accountable manager:				
Balloon operation				
Starting date of commercial operation and, where relevant, date of change to existing commercial operation.				
Information on balloon(s) used, commercial operation(s) and continuing airworthiness management:[1]				
Balloon type	**Balloon registration**	**Main base**	**Type(s) of operation**[2]	**Continuing airworthiness management organisation**[3]
Where applicable, list of the AltMoCs with references to the associated AMC (annex to this declaration):				
Statements				
☐ The operator complies, and will continue to comply, with the essential requirements set out in the Civil Aviation Regulations and with the requirements of MCAR-Balloons. In particular, the operator conducts its commercial operations in accordance with the following requirements of Subpart ADD of Part-BOP to MCAR-Balloons.				
☐ The management system documentation, including the operations manual, comply with the requirements of Subpart ADD and all flights will be carried out in accordance with the provisions of the operations manual as required by point BOP.ADD.005(b) of Subpart ADD.				
☐ All balloons operated either have a certificate of airworthiness issued in accordance with MCAR-Part-21 or meet the specific airworthiness requirements applicable to balloons that are registered in a third country and are subject to a wet lease agreement				

[1] Complete the table. If there is not enough space to list the information, it shall be listed in a separate annex. The annex shall be dated and signed.

[2] '"Type(s) of operation" refers to the type(s) of commercial operation conducted with the balloon.

[3] Information about the organisation responsible for the continuing airworthiness management shall include the name of the organisation, the address and the approval reference.

or a dry lease agreement, as required by points BOP.ADD.110 and BOP.ADD.115(b) and (c) and (c) of Subpart ADD.
☐ All flight crew members hold a licence and ratings issued or accepted in accordance with Part-BFCL to this MCAR, as required by point BOP.ADD.300(c) of Subpart ADD.
☐ The operator will notify the Authority of any changes in circumstances affecting its compliance with the essential requirements set out in the Civil Aviation Regulations and with the requirements of this MCAR as declared to the Authority through this declaration and any changes to the information and lists of AltMoCs included in and annexed to this declaration, as required by point BOP.ADD.105(a) of Subpart ADD.
☐ The operator confirms that all information included in this declaration, including its annexes, is complete and correct.
Date, name and signature of the accountable manager

PART – REQUIREMENTS FOR BALLONS FLIGHT CREW LICENSING (Part-BFCL)

SUBPART GEN — GENERAL REQUIREMENTS

BFCL.001 Scope

This MCAR-Part-BFCL establishes the requirements for the issue of a balloon pilot licence ("BPL") and associated privileges, ratings and certificates, and the conditions for their validity and use.

BFCL.005 Competent authority

For the purpose of this MCAR, the competent authority shall be the Authority (Director of Civil Aviation) to which a person applies for the issue of a BPL or associated privileges, ratings or certificates.

BFCL.010 Classes and groups of balloons

For the purpose of this MCAR, balloons shall be categorised in the following classes and groups:

(a) "hot-air balloon" class:

(1) group A: envelope capacity up to 3 400 m3 (120 069 ft3);

(2) group B: envelope capacity between 3 401 m3 (120 070 ft3) and 6 000 m3 (211 888 ft3);

(3) group C: envelope capacity between 6 001 m3 (211 889 ft3) and 10 500 m3 (370 804 ft3);

(4) group D: envelope capacity of more than 10 500 m3 (370 804 ft3);

(b) "gas balloon" class;

(c) "mixed balloon" class;

(d) "hot-air airship" class.

BFCL.015 Application for and issue, revalidation and renewal of a BPL as well as associated privileges, ratings and certificates

(a) An application for the following shall be submitted to the Authority in a form and manner established by that Authority:

(1) the issue of a BPL and associated ratings;

(2) the extension of the privileges of a BPL;

(3) the issue of a flight instructor (for balloons) ("FI(B)") certificate;

(4) the issue, revalidation and renewal of a flight examiner (for balloons) ("FE(B)") certificate; and

(5) any amendments to the BPL and associated privileges, ratings certificates.

(b) An application specified in paragraph (a) shall be accompanied by evidence that the applicant complies with the relevant requirements established in this MCAR and in MCAR-Part-MED.

(c) Any limitation or extension of the privileges granted by a licence, rating or certificate shall be endorsed on the licence or certificate by the Authority.

(d) A person shall not hold at any time more than one BPL issued in accordance with this MCAR.

(e) A licence holder shall submit applications as specified in paragraph (a) to the Authority in accordance with this MCAR, or MCAR-Part-FCL or Part-SFCL of MCAR Sailplanes, as applicable.

(f) Reserved

(g) Applicants shall apply for the issue of a BPL and associated ratings, privileges or certificates not later than 6 months after having successfully completed the skill test or assessment of competence.

AMC1 BFCL.015 Application for and issue, revalidation and renewal of a BPL as well as associated privileges, ratings and certificates

APPLICATION AND REPORT FORMS

Application and report forms can be found as follows:

(a) for skill tests and proficiency checks for the balloon pilot licence (BPL) as well as for the commercial operation rating, in AMC1 BFCL.410(b)(3); and

(b) for the assessment of competence for the flight instructor (balloon) FI(B), in AMC3 BFCL.345.

GM1 BFCL.015(c) Application for and issue, revalidation and renewal of a BPL as well as associated privileges, ratings and certificates

HOT-AIR BALLOON GROUP ENDORSEMENTS AND RECENCY

When complying with recency requirements for the hot-air balloon class in a smaller balloon group, a licence endorsement related to privileges for a bigger balloon group does not need to be removed from the licence. Those privileges for the bigger group remain 'inactive' and can be exercised once the recency requirements are complied with in that bigger group.

For example, if a BPL holder holds privileges for hot-air balloon groups A, B and C and completes the proficiency check in accordance with point BFCL.160 in a hot-air balloon that represents group B, it is not necessary for the BPL holder to have the licence reissued without an endorsement for group C. The privileges for group C can be exercised after complying with recency requirements in group C balloons.

BFCL.030 Practical skill test

Except for the skill test for the commercial operation rating as specified in point BFCL.215, an applicant for a skill test shall be recommended for the test by the ATO or the DTO that is responsible for the training undertaken by the applicants, once the training is completed. The training records shall be made available to the examiner by the ATO or DTO.

BFCL.035 Crediting of flight time

Applicants for a BPL or an associated privilege, rating or certificate shall be fully credited with all solo, dual instruction or PIC flight time on balloons towards the requirement of a total flight time for the licence, privilege, rating or certificate.

BFCL.045 Obligation to carry and present documents

(a) When exercising the privileges of BPL licence, BPL holders shall carry all of the following:

(1) a valid BPL;

(2) a valid medical certificate;

(3) a personal identification document containing his or her photo;

(4) sufficient logbook data to demonstrate compliance with the requirements of this MCAR.

(b) Student pilots shall carry on all solo flights:

(1) the documents as specified in paragraphs (a)(2) and (a)(3); and

(2) evidence of the authorisation required by point BFCL.125(a).

(c) BPL holders or student pilots shall without undue delay present the documents as specified in paragraph (a) or (b) for inspection upon request by an authorised representative of the Authority.

AMC1 BFCL.045(a)(4) Obligation to carry and present documents

SUFFICIENT LOGBOOK DATA

In order to be able to demonstrate compliance with the requirements of MCAR-Part-BFCL, a BPL holder should carry either the full logbook or at least excerpts or copies of those parts of the logbook (in paper or electronic format) in which compliance with the requirements that are related to the exercised privileges is documented.

BFCL.050 Recording of flight time

BPL holders and student pilots shall keep a reliable record of the details of all flights flown in a form and manner established by the Authority.

AMC1 BFCL.050 Recording of flight time

GENERAL

(a) The record of the flights flown should contain at least the following information:

(1) personal details: name(s) and address of the pilot; and

(2) for each flight:

(i) name(s) of pilot-in-command (PIC);

(ii) date of flight;

(iii) place and time of departure and arrival;

(iv) type, including make, model, and registration of the balloon;

(v) total time of flight;

(vi) accumulated total time of flight;

(v) details on pilot function, namely PIC, including solo, dual, FI(B) or flight examiner (balloon) FE(B); and

(vi) operational conditions, namely if the operation takes place at day or night and whether it is a free flight or tethered flight.

(b) Logging of time

(1) PIC flight time

(i) Holders of a licence may log as PIC time all of the flight time during which they are the PIC.

(ii) Applicants for or holders of a BPL may log as PIC time all supervised solo flight time as well as flight time of successfully completed skill tests and proficiency checks, provided that, in the case of supervised solo flight time, the logbook entry is signed by the supervising instructor.

(iii) Holders of an FI(B) certificate may log as PIC all flight time during which they act as an instructor in a balloon.

(iv) Holders of an FE(B) certificate may log as PIC all flight time during which they acts as an examiner in a balloon.

(2) Instruction time

A summary of all time logged by an applicant for a licence or rating as flight instruction may be logged if certified by the appropriately rated or authorised instructor from whom it was received.

(c) Format of the record

A suitable format should be used that contains the relevant items mentioned in (a) and additional information specific to the type of operation.

BFCL.065 Curtailment of privileges of BPL holders aged 70 years or older in commercial passenger ballooning

BPL holders who have attained the age of 70 years shall not act as pilots of a balloon engaged in commercial passenger balloon operations.

GM1 BFCL.065 Curtailment of privileges of BPL holders aged 70 years or older in commercial passenger ballooning

APPLICABILITY OF AGE LIMITATION

'Commercial passenger ballooning' as per point BFCL.065 includes any flight during which fare-paying passengers are carried. This means that, for example, if during a competition or a promotion flight fare-paying passengers are carried, the age limitation of point BFCL.065 for the BPL holder applies.

BFCL.070 Limitation, suspension or revocation of licences, privileges, ratings and certificates

(a) A BPL as well as associated privileges, ratings and certificates issued in accordance with this MCAR may be limited, suspended or revoked by the Authority in accordance with the conditions and procedures laid down in MCAR-Part-ARA if a BPL holder does not comply with the essential requirements set out in MCAR-Part-FCL or with the requirements of this MCAR or of MCAR-Part-MED.

(b) BPL holders shall immediately return the licence or certificate to the Authority if their licence, privilege, rating or certificate has been limited, suspended or revoked.

SUBPART BPL — BALLOON PILOT LICENCE ("BPL")

BFCL.115 BPL – Privileges and conditions

(a) The privileges of a BPL holder are to act as PIC in balloons:

(1) without remuneration in non-commercial operations;

(2) in commercial operations if he or she holds a commercial operation rating in accordance with point BFCL.215 of Subpart ADD of this MCAR.

(b) By way of derogation from paragraph (a)(1), a BPL holder who has instructor or examiner privileges may receive remuneration for:

(1) the provision of flight instruction for the BPL;

(2) the conduct of skill tests and proficiency checks for the BPL;

(3) the training, testing and checking for the privileges, ratings and certificates attached to a BPL.

(c) BPL holders shall exercise BPL privileges only if they comply with the applicable recency requirements and only if their medical certificate, appropriate to the privileges exercised, is valid.

BFCL.120 BPL – Minimum age

Applicants for a BPL shall be at least 16 years of age.

BFCL.125 BPL – Student pilot

(a) Student pilots shall not fly solo unless authorised to do so and supervised by a flight instructor for balloons (FI(B)).

(b) Student pilots shall be at least 14 years of age to be allowed on solo flights.

BFCL.130 BPL – Training course and experience requirements

Applicants for a BPL shall complete a training course at an ATO or a DTO. The course shall be tailored to the privileges sought and shall include:

(a) theoretical knowledge as specified in point BFCL.135(a);

(b) at least 16 hours of flight instruction in either hot-air balloons that represent group A of that class, or gas balloons, including at least:

(1) 12 hours of dual flight instruction;

(2) 10 inflations and 20 take-offs and landings; and

(3) One supervised solo flight with a flight time of at least 30 minutes.

AMC1 BFCL.130 BPL – Training course and experience requirements

THEORETICAL KNOWLEDGE INSTRUCTION FOR THE BPL

(a) General

The training should cover aspects related to non-technical skills in an integrated manner, taking into account the particular risks associated with the licence and the activity. The theoretical knowledge instruction provided by the declared training organisation (DTO) or approved training organisation (ATO) should include a certain element of formal classroom work but may also include other methods of delivery — for example, interactive video, slide or tape presentation, computer-based training and other media distance-learning courses. The training organisation responsible for the training has to check whether all the appropriate elements of the training course of theoretical knowledge instruction have been completed to a satisfactory standard before recommending the applicant for the examination.

(b) Syllabus

The following table contains the syllabus for theoretical knowledge instruction for the BPL:

Note: The content of Subjects 5 (Principles of flight), 6 (Operational procedures), 7 (Flight performance and planning), and 8 (Aircraft general knowledge, envelope and systems and emergency equipment) should contain aspects as relevant for the class of balloon used for the training, unless a certain element is specifically marked as relevant for one particular class only.

1.	**AIR LAW AND ATC PROCEDURES**
1.1.	International law: conventions, agreements and organisations
1.2.	Airworthiness of aircraft
1.3.	Aircraft nationality and registration marks
1.4.	Personnel licensing
1.5.	Rules of the air
1.6.	Procedures for air navigation: aircraft operations
1.7.	Air traffic regulations: airspace structure
1.8.	Air traffic services (ATS) and air traffic management (ATM)
1.9.	Aeronautical information services (AIS)
1.10.	Aerodromes, external take-off sites
1.11.	Search and rescue
1.12.	Security

1.13.	Accident reporting
1.14.	National law
2.	**HUMAN PERFORMANCE**
2.1.	Human factors: basic concepts
2.2.	Basic aviation physiology and health maintenance
2.3.	Basic aviation psychology
2.4.	Use of oxygen
3.	**METEOROLOGY**
3.1.	The atmosphere
3.2.	Wind
3.3.	Thermodynamics
3.4.	Clouds and fog
3.5.	Precipitation
3.6.	Air masses and fronts
3.7	Pressure systems
3.8.	Climatology
3.9.	Flight hazards
3.10.	Meteorological information
4.	**COMMUNICATIONS**
4.1.	Definitions
4.2.	VFR communications
4.2.1	VFR communication at uncontrolled airfields
4.2.2.	VFR communication at controlled airfields
4.2.3.	VFR communication with ATC (en-route)
4.3.	General operating procedures
4.4.	Relevant weather information terms (VFR)
4.5.	Action required to be taken in case of communication failure
4.6.	Distress and urgency procedures
4.7.	General principles of VHF propagation and allocation of frequencies
5.	**PRINCIPLES OF FLIGHT**
5.1.	Principles of flight
5.2.	Aerostatics
5.3.	Loading limitations
5.4.	Operational limitations
6.	**OPERATIONAL PROCEDURES**
6.1.	General requirements
6.2.	Special operational procedures and hazards (general aspects)
6.3.	Emergency procedures
7.	**FLIGHT PERFORMANCE AND PLANNING**
7.1.	Mass
7.1.1.	Purpose of mass considerations
7.1.2.	Loading

7.2.	Performance
7.2.1.	Performance: general
7.3.	Flight planning and flight monitoring
7.3.1.	Flight planning: general
7.3.2.1.	Fuel planning (hot-air balloons only)
7.3.2.2.	Ballast planning (gas balloons only)
7.3.3.	Pre-flight preparation
7.3.4.	ICAO flight plan (ATS flight plan)
7.3.5.	Flight monitoring and in-flight re-planning
8.	**AIRCRAFT GENERAL KNOWLEDGE, ENVELOPE AND SYSTEMS AND EMERGENCY EQUIPMENT**
8.1.	System design, loads, stresses and maintenance
8.2.	Envelope
8.3.1.	Burner (hot-air balloon only)
8.3.2.	Basket
8.4.1	Fuel cylinders (hot-air balloons only)
8.4.2.	Lifting gas (gas balloons only)
8.5.	Ballast (gas balloons only)
8.6.	Fuel (hot-air balloons only)
8.7.	Instruments
8.8.	Emergency equipment
9.	**NAVIGATION**
9.1.	General navigation
9.2.	Basics of navigation
9.3.	Magnetism and compasses
9.4.	Charts
9.5.	Dead reckoning navigation
9.6.	In-flight navigation
9.7.	Use of GNSS
9.8.	Use of ATS

AMC2 BFCL.130 BPL – Training course and experience requirements

FLIGHT INSTRUCTION FOR THE BPL

(a) Entry to training

Before being accepted for training, an applicant should be informed that the appropriate medical certificate must be obtained before solo flying is permitted.

(b) Flight instruction — general

(1) The BPL flight instruction syllabus should take into account the principles of threat and error management (TEM) and also cover:

(i) pre-flight operations, including load calculations, balloon inspection and servicing;

(ii) crew and passenger briefings;

(iii) inflation and crowd control;

(iv) control of the balloon by external visual reference;

(v) take-off in different wind conditions;

(vi) approach from low and high level;

(vii) landings in different surface wind conditions;

(viii) cross-country flying using visual reference and dead reckoning;

(ix) emergency operations, including simulated balloon equipment malfunctions;

(x) compliance with air traffic services procedures and communication procedures;

(xi) avoidance of nature protection areas; and

(xii) landowner relations.

(2) Before allowing applicants to undertake their first solo flight, the FI should ensure that they can operate the required systems and equipment.

(c) Syllabus of flight instruction (hot-air balloon)

(1) The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore, the demonstrations and practices need not necessarily be given in the order listed. The actual order and content will depend upon the following interrelated factors:

(i) the applicant's progress and ability;

(ii) the weather conditions affecting the flight;

(iii) the flight time available;

(iv) the instructional technique considerations;

(v) the local operating environment; and

(vi) the applicability of the exercises to the balloon type.

(2) Each of the exercises requires the applicant to be aware of the need for as well as the principles of good airmanship and look-out, which should be emphasised at all times.

(3) List of exercises

Exercise 1: Familiarisation with the balloon

(i) characteristics of the balloon;

(ii) the components or systems;

(iii) refuelling of the cylinders;

(iv) instruments and equipment; and

(v) use of checklist(s) and procedures.

Exercise 2: Preparation for flight

(i) documentation and equipment;

(ii) weather forecast and actuals;

(iii) flight planning:

(A) notices to airmen (NOTAMs);

(B) airspace structure;

(C) sensitive areas (for example, nature protection areas);

(D) expected track and distance;

(E) pre-flight picture; and

(F) possible landing fields.

(iv) launch field:

(A) permission;

(B) field selection;

(C) behaviour; and

(D) adjacent fields; and

(v) load calculations.

Exercise 3: Crew and passenger briefing

(i) clothing;

(ii) crew briefing; and

(iii) passenger briefing.

Exercise 4: Assembly and layout

(i) crowd control;

(ii) rigging envelope, basket and burner;

(iii) burner test;

(iv) use of restraint line; and

(v) pre-inflation checks.

Exercise 5: Inflation

(i) crowd control;

(ii) cold inflation;

(iii) use of the inflation fan; and

(iv) hot inflation.

Exercise 6: Take-off in different wind conditions

(i) pre-take-off checks and briefings;

(ii) heating for controlled climb;

(iii) ‘hands off and hands on' procedure for ground crew;

(iv) assessment of lift;

(v) use of quick release;

(vi) assessment of wind and obstacles;

(vii) take-off in wind of different speeds, with and without shelter; and

(viii) preparation for false lift.

Exercise 7: Climb to level flight

(i) climbing with a predetermined rate of climb;

(ii) look-out procedures;

(iii) effect on envelope temperature;

(iv) maximum rate of climb according to the manufacturer's flight manual; and

(v) levelling off at selected altitude.

Exercise 8: Level flight

(i) maintaining level flight by:

(A) use of instruments only;

(B) use of visual references only; and

(C) all available means; and

(ii) use of parachute and turning vents (if applicable).

Exercise 9: Descent to level flight

(i) descent with a predetermined rate of descent;

(ii) fast descent;

(iii) look-out procedures;

(iv) maximum rate of descent according to the manufacturer's flight manual;

(v) use of parachute;

(vi) parachute stall;

(vii) cold descent; and

(viii) levelling off at selected altitude.

Exercise 10A: Emergencies — systems

(i) pilot light failure;

(ii) burner failure, valve leaks, flame out and re-light;

(iii) gas leaks;

(iv) envelope over temperature;

(v) envelope damage in-flight; and

(vi) parachute or rapid deflation system failure.

Exercise 10B: Other emergencies

(i) fire extinguisher;

(ii) fire on ground;

(iii) fire in the air;

(iv) contact with electrical power lines;

(v) obstacle avoidance; and

(vi) escape drills, location and use of emergency equipment.

Exercise 11: Navigation

(i) maps selection;

(ii) plotting expected track;

(iii) marking positions and time;

(iv) calculation of distance, speed and fuel consumption;

(v) ceiling limitations (ATC, weather and envelope temperature);

(vi) planning ahead;

(vii) monitoring of weather development and related decision-making/acting;

(viii) monitoring of fuel consumption and envelope temperature;

(ix) ATC liaison (if applicable);

(x) communication with retrieve crew; and

(xi) use of GNSS (if applicable).

Exercise 12: Fuel management

(i) cylinder arrangement and burner systems;

(ii) pilot light supply (vapour or liquid);

(iii) use of master cylinders (if applicable);

(iv) fuel requirement and expected fuel consumption;

(v) fuel state and pressure;

(vi) fuel reserves;

(vii) cylinder contents gauge and change procedure; and

(viii) use of cylinder manifolds.

Exercise 13: Approach from low level

(i) pre-landing checks;

(ii) passenger pre-landing briefing;

(iii) selection of field;

(iv) use of burner and parachute;

(v) look-out procedures; and

(vi) missed approach and fly on.

Exercise 14: Approach from high level

(i) pre-landing checks;

(ii) passenger pre-landing briefing;

(iii) selection of field;

(iv) rate of descent;

(v) use of burner and parachute;

(vi) look-out procedures; and

(vii) missed approach and fly on.

Exercise 15: Operating at low level

(i) use of burner, whisper burner and parachute;

(ii) look-out procedures;

(iii) avoidance of low-level obstacles;

(iv) avoidance of sensitive areas and nature protection areas; and

(v) landowner relations.

Exercise 16: Landing in different wind conditions

(i) pre-landing checks;

(ii) passenger pre-landing briefing;

(iii) selection of field;

(iv) turbulence (in the case of landings with high wind speed only);

(v) use of burner and pilot lights;

(vi) use of parachute (or other deflation system) and turning vents (if applicable);

(vii) look-out procedures;

(viii) dragging and deflation;

(ix) landowner relations; and

(x) airmanship.

Exercise 17: First solo flight

(i) supervised flight preparation; and

(ii) instructor's briefing, observation of flight and de-briefing.

Note: Exercises 1 to 16 must have been completed and the student must have achieved a sufficient level of competence to safely perform a flight before undertaking the first solo flight.

(d) Syllabus of flight instruction (gas balloon)

(1) The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore, the demonstrations and practices need not necessarily be given in the order listed. The actual order and content will depend upon the following interrelated factors:

(i) the applicant's progress and ability;

(ii) the weather conditions affecting the flight;

(iii) the flight time available;

(iv) the instructional technique considerations;

(v) the local operating environment; and

(vi) the applicability of the exercises to the balloon type.

(2) Each of the exercises involves the need for the pilot under training to be aware of the needs of good airmanship and look-out, which should be emphasised at all times.

(3) List of exercises

Exercise 1: Familiarisation with the balloon

(i) characteristics of the balloon;

(ii) the components or systems;

(iii) instruments and equipment; and

(iv) use of checklist(s) and procedures.

Exercise 2: Preparation for flight

(i) documentation and equipment;

(ii) weather forecast and actuals;

(iii) flight planning:

(A) NOTAMs;

(B) airspace structure;

(C) sensitive areas (for example, nature protection areas);

(D) expected track and distance;

(E) pre-flight picture; and

(F) possible landing fields;

(iv) launch field:

(A) permission;

(B) behaviour; and

(C) adjacent fields; and

(v) load calculations.

Exercise 3: Crew and passenger briefing

(i) clothing;

(ii) crew briefing; and

(iii) passenger briefing.

Exercise 4: Assembly and layout

(i) crowd control;

(ii) rigging envelope and basket (balloon with net);

(iii) rigging envelope and basket (netless balloon); and

(iv) ballast check.

Exercise 5: Inflation

(i) crowd control;

(ii) inflation procedure according to the manufacturer's flight manual; and

(iii) avoidance of electrostatic discharge.

Exercise 6: Take-off in different wind conditions

(i) pre-take-off checks and briefings;

(ii) preparation for controlled climb;

(iii) 'hands off and hands on' procedure for ground crew;

(iv) assessment of wind and obstacles;

(v) take-off in wind of different speeds, with and without shelter; and

(vi) preparation for false lift.

Exercise 7: Climb to level flight

(i) climb with a predetermined rate of climb;

(ii) look-out procedures;

(iii) maximum rate of climb according to the manufacturer's flight manual; and

(iv) levelling off at selected altitude.

Exercise 8: Level flight

(i) maintaining level flight by:

(A) use of instruments only;

(B) use of visual references only; and

(C) all available means; and

(ii) use of parachute or valve.

Exercise 9: Descent to level flight

(i) descent with a predetermined rate of descent;

(ii) fast descent;

(iii) look-out procedures;

(iv) maximum rate of descent according to the manufacturer's flight manual;

(v) use of parachute or valve; and

(vi) levelling off at selected altitude.

Exercise 10: Emergencies

(i) closed appendix during take-off and climb;

(ii) envelope damage in-flight;

(iii) parachute or valve failure;

(iv) contact with electrical power lines;

(v) obstacle avoidance; and

(vi) escape drills, location and use of emergency equipment.

Exercise 11: Navigation

(i) map selection;

(ii) plotting expected track;

(iii) marking positions and time;

(iv) calculation of distance, speed and ballast consumption;

(v) ceiling limitations (ATC, weather and ballast);

(vi) planning ahead;

(vii) monitoring of weather development and acting so;

(viii) monitoring of ballast consumption;

(ix) ATC liaison (if applicable);

(x) communication with retrieve crew; and

(xi) use of GNSS (if applicable).

Exercise 12: Ballast management

(i) minimum ballast;

(ii) arrangement and securing of ballast;

(iii) ballast requirement and expected ballast consumption; and

(iv) ballast reserves.

Exercise 13: Approach from low level

(i) pre-landing checks;

(ii) passenger pre-landing checks;

(iii) selection of field;

(iv) use of ballast and parachute or valve;

(v) use of trail rope (if applicable);

(vi) look-out procedures; and

(vii) missed approach and fly on.

Exercise 14: Approach from high level

(i) pre-landing checks;

(ii) passenger pre-landing checks;

(iii) selection of field;

(iv) rate of descent;

(v) use of ballast and parachute or valve;

(vi) use of trail rope (if applicable);

(vii) look-out procedures; and

(viii) missed approach and fly on.

Exercise 15: Operating at low level

(i) use of ballast and parachute or valve;

(ii) look-out procedures;

(iii) avoidance of low-level obstacles;

(iv) avoidance of sensitive areas and nature protection areas; and

(v) landowner relations.

Exercise 16: Landing in different wind conditions

(i) pre-landing checks;

(ii) passenger pre-landing briefing;

(iii) selection of field;

(iv) turbulence (in the case of landings with high wind speed only);

(v) use of ballast and parachute or valve;

(vi) look-out procedures;

(vii) use of rip panel;

(viii) dragging;

(ix) deflation;

(x) avoidance of electrostatic discharge; and

(xi) landowner relations.

Exercise 17: First solo flight

(i) supervised flight preparation; and

(ii) instructor's briefing, observation of flight and de-briefing.

Note: Exercises 1 to 16 have to be completed and the student must have achieved a sufficient level of competence to safely perform a flight before undertaking the first solo flight.

BFCL.135 BPL – Theoretical knowledge examination

(a) Theoretical knowledge

Applicants for a BPL shall demonstrate a level of theoretical knowledge that is appropriate to the privileges sought through examinations on the following:

(1) common subjects:

(i) air law;

(ii) human performance;

(iii) meteorology;

(iv) communications; and

(2) specific subjects concerning balloons:

(i) principles of flight;

(ii) operational procedures;

(iii) flight performance and planning;

(iv) aircraft general knowledge related to balloons; and

(v) navigation.

(b) Responsibilities of the applicant

(1) The applicant shall take the entire set of theoretical knowledge examinations for the BPL under the responsibility of the State's Authority.

(2) The applicant shall take the theoretical knowledge examination only if recommended by the ATO or the DTO that is responsible for his or her training and once he or she has completed the appropriate elements of the training course of theoretical knowledge instruction to a satisfactory standard.

(3) The recommendation by the ATO or the DTO shall be valid for 12 months. If the applicant has failed to take at least one theoretical knowledge examination paper within this validity period, the need for further training shall be determined by the ATO or the DTO, based on the needs of the applicant.

(c) Pass standards

(1) A pass in a theoretical knowledge examination paper shall be awarded to the applicant if he or she has achieved at least 75 % of the marks allocated to that paper. No penalty marking shall be applied.

(2) Unless otherwise specified in this MCAR, an applicant is considered to have successfully completed the required theoretical knowledge examination for the BPL if he or she has passed all the required theoretical knowledge examination papers within a period of 18 months counted from the end of the calendar month when the applicant first attempted to take the examination.

(3) If an applicant has failed to pass one of the theoretical knowledge examination papers within four attempts or has failed to pass all papers within the period mentioned in paragraph (2), he or she shall retake the complete set of theoretical knowledge examination papers.

(4) Before retaking the theoretical knowledge examinations, the applicant shall undertake further training at an ATO or a DTO. The ATO or the DTO shall determine the extent and scope of the training, based on the needs of the applicant.

(d) Validity period

The theoretical knowledge examination shall be valid for a period of 24 months counted from the day when the applicant successfully completed the theoretical knowledge examination, in accordance with paragraph (c)(2).

AMC1 BFCL.135 BPL – Theoretical knowledge examinations

(a) The theoretical knowledge examinations for the BPL follow the syllabus for theoretical knowledge instruction for the BPL set out in AMC1 BFCL.130.

(b) The examinations should be in written form. However, for the subject Communications, practical classroom testing may be conducted.

(c) The examinations should comprise a total of 120 multiple-choice questions, covering all the subjects, with the following arrangements for questions and allocated time per subject:

Subject	Number of questions	Duration (in minutes)
Air law	20	40
Human performance	10	20
Meteorology	20	40
Communications	10	20
Navigation	20	75
Principles of flight*	10	20
Operational procedures*	10	20
Flight performance and planning*	10	20
Aircraft general knowledge*	10	20

* Content as relevant for either hot-air balloons or gas balloons, depending on the class privileges sought. These four subjects may be combined in one single examination paper that comprises 10 questions per subject (40 in total) and has a duration of 80 minutes. In any case, the pass rate as per point BFCL.135(c)(1) needs to be achieved for each subject.

(d) The period of 18 months mentioned in point BFCL.135(c)(2) should be counted from the end of the calendar month when the applicant first attempted an examination.

(e) The Authority should inform applicants of the language(s) in which the examination will be conducted.

GM1 BFCL.135 BPL – Theoretical knowledge examinations

TERMINOLOGY

The meaning of the following terms used in BFCL.135 is as follows:

(a) 'Entire set of examinations': an examination in all subjects required by the licence level.

(b) 'Examination': the demonstration of knowledge in one or more examination papers.

(c) 'Examination paper': a set of questions that covers one subject required by the licence level, to be answered by a candidate for examination.

(d) 'Attempt': a try to pass a specific examination paper.

BFCL.140 BPL – Crediting of theoretical knowledge

Applicants for the issue of a BPL shall be credited towards the theoretical knowledge requirements for the common subjects as specified in point BFCL.135(a)(1) if they:

(a) hold a licence in accordance with MCAR-Part-FCL or MCAR-Part-SFCL; or

(b) have passed the theoretical knowledge examinations for a licence as specified in paragraph (a), as long as this is done within the validity period specified in point BFCL.135(d).

BFCL.145 BPL – Practical skill test

(a) Applicants for a BPL shall demonstrate through the completion of a skill test the ability to perform, as PIC on a balloon, the relevant procedures and manoeuvres with competency appropriate to the privileges sought.

(b) Applicants shall complete the skill test in the same class of balloons in which the training course has been completed in accordance with point BFCL.130 and, in case of hot-air balloons, in a balloon that represents group A of that class.

(c) To take a skill test for the issue of a BPL, the applicant shall first pass the required theoretical knowledge examination.

(d) Pass standards

(1) The skill test shall be divided into different sections, representing all the different phases of a balloon flight.

(2) Failure in any item of a section shall cause the applicant to fail the entire section. If the applicant fails in only one section, he or she shall repeat only that section. Failure in more than one section shall require the applicant to retake the entire test.

(3) If the applicant needs to retake the test in accordance with paragraph (2) and fails in any section, including those sections that have been passed at a previous attempt, the applicant shall retake the entire test.

(e) If the applicant fails to achieve a pass in all sections of the test within two attempts, he or she shall receive further practical training.

AMC1 BFCL.145 BPL – Practical skill test

(a) GENERAL

(1) The take-off site should be chosen by the applicant depending on the actual meteorological conditions, the area which has to be overflown, and the possible options for suitable landing sites. The applicant should be responsible for the flight planning and should ensure that all equipment and documentation for the execution of the flight are on board.

(2) An applicant should indicate to the FE the checks and duties carried out. Checks should be completed in accordance with the flight manual or the authorised checklist for the balloon on which the test is being taken. During pre-flight preparation for the test, the applicant should be required to perform crew and passenger briefings and demonstrate crowd control. The load calculation should be performed by the applicant in compliance with the operations manual or flight manual for the balloon used.

(3) The flight time of the skill test should be at least 30 minutes.

(b) FLIGHT TEST TOLERANCE

The applicant should demonstrate the ability to:

(1) operate the balloon within its limitations;

(2) complete all manoeuvres with smoothness and accuracy;

(3) exercise good judgment and airmanship;

(4) apply aeronautical knowledge; and

(5) maintain control of the balloon at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

(c) CONTENT OF THE SKILL TEST

(1) The skill test contents and sections set out in this point should be used for the skill test for the issue of a BPL with privileges for the hot-air balloon class:

Note: Use of checklist(s), airmanship, control of balloon by external visual reference, look-out procedures, etc. apply in all sections.

SECTION 1: PRE-FLIGHT OPERATIONS, INFLATION AND TAKE-OFF	
a	Pre-flight documentation (licence, medical certificate, permits to take off, insurance certificate, aeronautical charts, aircraft flight manual (AFM), logbook, technical logbook, checklists, etc.), flight planning, NOTAM(s) and weather briefing
b	Balloon inspection and servicing
c	Suitability of launch site
d	Load calculation
e	Crowd control, crew and passenger briefings
f	Assembly and layout
g	Inflation and pre-take-off procedures
h	Take-off
i	ATC compliance (if applicable)
SECTION 2: GENERAL AIRWORK	
a	Climb to level flight
b	Level flight
c	Descent to level flight
d	Operating at low level
e	ATC compliance (if applicable)
SECTION 3: EN-ROUTE PROCEDURES	
a	Dead reckoning and map reading
b	Marking positions and time
c	Orientation and airspace structure
d	Maintenance of altitude
e	Fuel management
f	Communication with retrieve crew
g	ATC compliance (if applicable)
SECTION 4: APPROACH AND LANDING PROCEDURES	
a	Approach from low level, missed approach and fly on
b	Approach from high level, missed approach and fly on
c	Pre-landing checks
d	Passenger pre-landing briefing

e	Selection of landing field
f	Landing, dragging and deflation
g	ATC compliance (if applicable)
h	Actions after flight (recording of the flight, closing flight plan (if applicable), briefing passengers for packing balloon, contact landowner)
SECTION 5: ABNORMAL AND EMERGENCY PROCEDURES	
This section may be combined with Sections 1 through 4.	
a	Simulated fire on the ground and in the air
b	Simulated pilot light and burner failures
c	Other abnormal and emergency procedures as outlined in the appropriate flight manual
d	Simulated passenger health problems
e	Oral questions

(2) The skill test contents and sections set out in this point should be used for the skill test for the issue of a BPL with privileges for the gas balloon class:

Note: Use of checklist(s), airmanship, control of balloon by external visual reference, look-out procedures, etc. apply in all sections.

SECTION 1: PRE-FLIGHT OPERATIONS, INFLATION AND TAKE-OFF	
a	Pre-flight documentation (licence, medical certificate, permits to take off, insurance certificate, aeronautical charts, AFM, logbook, technical logbook, checklists, etc.), flight planning, NOTAM(s) and weather briefing
b	Balloon inspection and servicing
c	Suitability of launch site
d	Load calculation
e	Crowd control, crew and passenger briefings
f	Assembly and layout
g	Inflation and pre-take-off procedures
h	Take-off
i	ATC compliance (if applicable)
SECTION 2: GENERAL AIRWORK	
a	Climb to level flight
b	Level flight
c	Descent to level flight
d	Operating at low level
e	ATC compliance (if applicable)
SECTION 3: EN-ROUTE PROCEDURES	
a	Dead reckoning and map reading
b	Marking positions and time
c	Orientation and airspace structure
d	Maintenance of altitude

e	Ballast management
f	Communication with retrieve crew
g	ATC compliance (if applicable)
SECTION 4: APPROACH AND LANDING PROCEDURES	
a	Approach from low level, missed approach and fly on
b	Approach from high level, missed approach and fly on
c	Pre-landing checks
d	Passenger pre-landing briefing
e	Selection of landing field
f	Landing, dragging and deflation
g	ATC compliance (if applicable)
h	Actions after flight (recording of the flight, closing flight plan (if applicable), briefing passengers for packing balloon, contact landowner)
SECTION 5: ABNORMAL AND EMERGENCY PROCEDURES	
This Section may be combined with Sections 1 through 4.	
a	Simulated closed appendix during take-off and climb
b	Simulated parachute or valve failure
c	Other abnormal and emergency procedures as outlined in the appropriate flight manual
d	Simulated passenger health problems
e	Oral questions

BFCL.150 BPL – Extension of privileges to another balloon class or group

(a) The privileges of the BPL shall be limited to the class of balloon in which the skill test as specified in point BFCL.145 was taken, and, in the case of hot-air balloons, to group A of that class.

(b) In the case of hot-air balloons, the privileges of the BPL shall be extended to another group within the hot-air balloon class upon application if a pilot has completed at least:

(1) two instruction flights with an FI(B) on a balloon of the relevant group;

(2) the following amount of hours of flight time as PIC on balloons:

(i) at least 100 hours, if privileges for group B balloons are sought;

(ii) at least 200 hours, if privileges for group C balloons are sought;

(iii) at least 300 hours, if privileges for group D balloons are sought.

(c) Except for the mixed balloon class, the privileges of the BPL shall be extended to another balloon class, or, if privileges for the hot-air balloon class are sought,

to group A of the hot-air balloon class, upon application if a pilot has completed in the relevant balloon class and group:

(1) a training course at an ATO or a DTO, including at least:

(i) five dual instructional flights; or

(ii) in the case of an extension from hot-air balloons to hot-air airships, five hours of dual instruction time; and

(2) a skill test during which the pilot has demonstrated to the FE(B) an adequate level of theoretical knowledge for the other class in the following subjects:

(i) principles of flight;

(ii) operational procedures;

(iii) flight performance and planning;

(iv) aircraft general knowledge with regard to the balloon class for which the extension of privileges is sought.

(d) The completion of the training as specified in paragraphs (b)(1) and (c)(1) shall be entered in the logbook of the pilot and signed by:

(1) in the case of paragraph (b)(1), the instructor who is responsible for the instruction flights; and

(2) in the case of paragraph (c)(1), the head of training of the ATO or of the DTO that is responsible for the training.

(e) A BPL holder shall exercise his or her privileges in the mixed balloon class only if he or she has privileges for both the hot-air balloon class and the gas balloon class.

AMC1 BFCL.150(b) BPL – Extension of privileges to another balloon class or group

EXTENSION OF HOT-AIR BALLOON CLASS PRIVILEGES TO ANOTHER HOT-AIR BALLOON GROUP

(a) The training flights should concentrate on the differences between the group for which privileges are sought and the group(s) for which the pilot already has privileges. For example, handling needs to consider balloon performance differences arising from greater mass, inertia, response to the burner and, in some cases, differing deflation systems. Additional requirements arise for dealing with larger numbers of passengers.

(b) Instructors should only sign off as 'training completed' when they are satisfied that the pilot under training has achieved full technical and operational competence for balloons of all sizes included in the given group.

(c) An extension to group C is also valid for groups A and B. An extension to group D is also valid for groups A, B and C.

GM1 BFCL.150(b) BPL – Extension of privileges to another balloon class or group

EXTENSION OF HOT-AIR BALLOON CLASS PRIVILEGES TO ANOTHER HOT-AIR BALLOON GROUP

The two training flights stipulated in point BFCL.150(b)(1) constitute the minimum amount of training needed in the case of experienced pilots who seek to extend their privileges by one group size. The instructor may conduct additional training flights, as necessary for the candidate to acquire the competence needed, before entering the completion of training in the candidate's logbook.

AMC1 BFCL.150(c)(1) BPL – Extension of privileges to another balloon class or group

FLIGHT INSTRUCTION FOR THE EXTENSION OF PRIVILEGES TO THE HOT-AIR AIRSHIP CLASS

(a) The numbering of the exercises set out in point (d) should be used primarily as an exercise reference list and as a broad instructional sequencing guide; therefore, the demonstrations and practices need not necessarily be given in the order listed.

(b) In cases where the applicant already holds hot-air balloon privileges, the flight instruction should concentrate on all of the following:

(1) added complication of the engine;

(2) engine controls and different performance;

(3) airship operating limitations; and

(4) airship procedures.

(c) In cases where the applicant does not hold hot-air balloon privileges, the ATO or DTO, based on the candidate's experience, may decide to conduct training elements as per point (c) of AMC2 BFCL.130 on hot-air balloons before starting with the flight instruction on hot-air airships, in order to allow the candidate to develop competence in hot-air aircraft operation.

(d) In any case, the flying exercises should cover the revision or explanation of the following exercises:

Exercise 1: Familiarisation with the hot-air airship

(i) characteristics of the hot-air airship;

(ii) aerostatic and aerodynamic lift;

(iii) operating limitations;

(iv) airworthiness limitations;

(v) the components or systems;

(vi) instruments, minimum equipment and other equipment; and

(vii) use of checklist(s) and procedures.

Exercise 2: Preparation for flight

(i) documentation and equipment;

(ii) weather forecast and actuals;

(iii) flight planning:

(A) NOTAMs;

(B) airspace structure;

(C) sensitive areas;

(D) expected track and distance;

(E) pre-flight picture; and

(F) possible landing fields;

(iv) launch field:

(A) permission;

(B) behaviour;

(C) field selection;

(D) adjacent fields; and

(E) noise abatement; and

(v) load and fuel calculations.

Exercise 3: Crew and passenger briefing

(i) clothing;

(ii) crew briefing; and

(iii) passenger briefing.

Exercise 4: Assembly and layout

(i) crowd control;

(ii) rigging envelope, gondola, burner and engine;

(iii) burner test;

(iv) engine test; and

(v) pre-inflation checks.

Exercise 5: Inflation

(i) crowd control;

(ii) cold inflation:

(A) use of restraint line; and

(B) use of the inflation fan; and

(iii) hot inflation.

Exercise 6: Engine

(i) identification of main parts and controls;

(ii) familiarisation with operation and checking of the engine; and

(iii) engine checks before take-off.

Exercise 7: Pressurisation (if applicable)

(i) pressurisation fan operation;

(ii) super pressure and balance between pressure and temperature; and

(iii) pressure limitations.

Exercise 8: Take-off

(i) before take-off checks and briefings;

(ii) heating for controlled climb;

(iii) procedure for ground crew; and

(iv) assessment of wind and obstacles.

Exercise 9: Climb to level flight

(i) climbing with a predetermined rate of climb;

(ii) effect on envelope temperature and pressure;

(iii) maximum rate of climb according to the manufacturer's flight manual; and

(iv) level off at selected altitude.

Exercise 10: Level flight

(i) maintaining level flight by:

(A) use of instruments only;

(B) use of visual references only; and

(C) all available means;

(ii) maintaining level flight at different air speeds by taking aerodynamic lift into account;

(iii) turns; and

(iv) stationary flight.

Exercise 11: Descent to level flight

(i) descent with a predetermined rate of descent;

(ii) maximum rate of descent according to the manufacturer's flight manual; and

(iii) levelling off at selected altitude.

Exercise 12A: Emergencies — systems

(i) engine failure;

(ii) pressurisation failure;

(iii) rudder failure;

(iv) pilot light failure;

(v) burner failure, valve leaks, flame out and re-light;

(vi) fuel leaks;

(vii) envelope over temperature; and

(viii) envelope damage in-flight.

Exercise 12B: Other emergencies

(i) fire extinguishers;

(ii) fire on ground;

(iii) fire in the air;

(iv) electrical power supply failure;

(v) hard landing;

(vi) landing in strong wind;

(vii) contact with electrical power lines;

(viii) obstacle avoidance;

(ix) escape drills, location and use of emergency equipment.

Exercise 13: Navigation

(i) map selection and preparation;

(ii) plotting and steering expected track;

(iii) marking positions and time;

(iv) calculation of distance, speed and fuel consumption;

(v) ceiling limitations (ATC, weather and envelope temperature);

(vi) planning ahead;

(vii) monitoring of weather development and acting so;

(viii) monitoring of fuel and envelope temperature or pressure;

(ix) ATC liaison (if applicable);

(x) communication with ground crew; and

(xi) use of GNSS (if applicable).

Exercise 14: Fuel management

(i) engine arrangement and tank system;

(ii) cylinder arrangement and burner systems;

(iii) pilot light supply (vapour or liquid);

(iv) fuel requirement and expected fuel consumption for engine and burner;

(v) fuel state and pressure;

(vi) fuel reserves; and

(vii) cylinder and petrol tank contents gauge.

Exercise 15: Approach and go-around

(i) pre-landing checks;

(ii) selection of field into wind;

(iii) use of burner and engine;

(iv) look-out procedures; and

(v) missed approach and go-around.

Exercise 16: Approach with simulated engine failure

(i) pre-landing checks;

(ii) selection of field;

(iii) use of burner;

(iv) look-out procedures; and

(v) missed approach and go-around.

Exercise 17: Operating at low level

(i) use of burner and engine;

(ii) look-out procedures;

(iii) avoidance of low-level obstacles;

(iv) avoidance of sensitive areas and nature protection area;

(v) landowner relations; and

(v) noise abatement procedures.

Exercise 18: Steering

(i) assessment of wind; and

(i) correcting for wind to steer a given course.

Exercise 19: Final landing

(i) pre-landing checks;

(ii) use of burner and engine;

(iii) look-out;

(iv) deflation; and

(v) landowner relations.

AMC2 BFCL.150(c)(1) BPL – Extension of privileges to another balloon class or group

FLIGHT INSTRUCTION FOR THE EXTENSION OF PRIVILEGES TO THE GAS BALLOON CLASS

(a) The flight instruction for extending the privileges of a BPL to gas balloon privileges should follow the syllabus for initial BPL training on gas balloons, as set out in point (d) of AMC2 BFCL.130.

(b) Specific emphasis should be given to handling differences, related to class privileges held, and specific safety requirements for gas balloons.

AMC3 BFCL.150(c)(1) BPL – Extension of privileges to another balloon class or group

FLIGHT INSTRUCTION FOR THE EXTENSION OF PRIVILEGES TO THE HOT-AIR BALLOON CLASS

(a) The flight instruction for extending the privileges of a BPL to hot-air balloon privileges should follow the syllabus for initial BPL training on hot-air balloons, as set out in point (c) of AMC2 BFCL.130.

(b) Specific emphasis should be given to handling differences, related to class privileges held, and specific safety requirements for hot-air balloons.

AMC1 BFCL.150(c)(2) BPL – Extension of privileges to another balloon class or group

(a) SKILL TEST FOR THE EXTENSION OF PRIVILEGES TO THE HOT-AIR AIRSHIP CLASS

(1) The take-off site should be chosen by the applicant depending on the actual meteorological conditions, the area which has to be overflown,

and the possible options for suitable landing sites. The applicant should be responsible for the flight planning and should ensure that all equipment and documentation for the execution of the flight are on board.

(2) An applicant should indicate to the FE the checks and duties carried out. Checks should be completed in accordance with the flight manual or the authorised checklist for the balloon on which the test is being taken. During pre-flight preparation for the test, the applicant should be required to perform crew and passenger briefings and demonstrate crowd control. The load calculation should be performed by the applicant in compliance with the operations manual or flight manual for the hot-air airship used.

(3) The flight time of the skill test should be at least 30 minutes.

(b) FLIGHT TEST TOLERANCE

The applicant should demonstrate the ability to:

(1) operate the hot-air airship within its limitations;

(2) complete all manoeuvres with smoothness and accuracy;

(3) exercise good judgment and airmanship;

(4) apply aeronautical knowledge; and

(5) maintain control of the airship at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

(c) CONTENT OF THE SKILL TEST

The following skill test contents and sections should be used for the skill test for the issue of a BPL hot-air airship extension:

Note: Use of checklist(s), airmanship, control of hot-air airship by external visual reference, look-out procedures, etc. apply in all sections.

SECTION 1: PRE-FLIGHT OPERATIONS, INFLATION AND TAKE-OFF	
a	Pre-flight documentation (licence, medical certificate, permits to take off, insurance certificate, aeronautical charts, AFM, logbook, technical logbook, checklists etc.), flight planning, NOTAM(s) and weather briefing
b	Hot-air airship inspection and servicing
c	Suitability of launch site
d	Load calculation
e	Crowd control, crew and passenger briefings
f	Assembly and layout
g	Inflation and pre-take-off procedures
h	Take-off

i	ATC compliance (if applicable)
SECTION 2: GENERAL AIRWORK	
a	Climb to level flight
b	Level flight
c	Turns
d	Stationary flight
e	Descent to level flight
f	Operating at low level
g	ATC compliance (if applicable)
SECTION 3: EN-ROUTE PROCEDURES	
a	Dead reckoning and map reading
b	Marking positions and time
c	Orientation and airspace structure
d	Plotting and steering expected track
e	Maintenance of altitude
f	Fuel management
g	Pressure and engine parameter checks
h	Communication with ground crew
i	ATC compliance (if applicable)
SECTION 4: APPROACH AND LANDING PROCEDURES	
a	Approach, missed approach and go-around
b	Pre-landing checks
c	Selection of landing field
d	Landing and deflation
e	ATC compliance (if applicable)
f	Actions after flight (recording of the flight, closing flight plan (if applicable), briefing passengers for packing hot-air airship, contact landowner)
SECTION 5: ABNORMAL AND EMERGENCY PROCEDURES	
This section may be combined with Sections 1 through 4	
a	Simulated fire on the ground and in the air
b	Simulated pilot light, burner and engine failures
c	Approach with simulated engine failure, missed approach and go-around
d	Simulated passenger health problems
e	Other abnormal and emergency procedures as outlined in the appropriate flight manual
f	Oral questions

AMC2 BFCL.150(c)(2) BPL – Extension of privileges to another balloon class or group

SKILL TEST FOR THE EXTENSION OF PRIVILEGES TO THE GAS BALLOON CLASS

To extend the privileges of a BPL to gas balloon privileges, BPL holders should take the skill test for the initial issue of a BPL on gas balloons, as set out in AMC1 BFCL.145.

AMC3 BFCL.150(c)(2) BPL – Extension of privileges to another balloon class or group

SKILL TEST FOR THE EXTENSION OF PRIVILEGES TO THE HOT-AIR BALLOON CLASS

To extend the privileges of a BPL to hot-air balloon privileges, BPL holders should take the skill test for the initial issue of a BPL on hot-air balloons, as set out in AMC1 BFCL.145.

AMC4 BFCL.150(c)(2) BPL – Extension of privileges to another balloon class or group

THEORETICAL KNOWLEDGE FOR EXTENSION OF PRIVILEGES TO ANOTHER BALLOON CLASS

During the skill test as per point BFCL.150(c)(2), the demonstration of an adequate level of theoretical knowledge for the other balloon class should cover all of the following from the syllabus set out in point (b) of AMC1 BFCL.130:

Note: The content of the below syllabus should contain aspects as relevant for the class of balloon used for the training, unless a certain element is specifically marked as relevant for particular classes only.

5.	**PRINCIPLES OF FLIGHT**
5.1.	Principles of flight
5.2.	Aerostatics
5.3.	Loading limitations
5.4.	Operational limitations
6.	**OPERATIONAL PROCEDURES**
6.1.	General requirements
6.2.	Special operational procedures and hazards
6.3.	Emergency procedures
7.	**FLIGHT PERFORMANCE AND PLANNING**
7.1.	Mass
7.1.1.	Purpose of mass considerations

7.1.2.	Loading
7.2.	Performance
7.3.	Flight planning and flight monitoring
7.3.2.1.	Fuel planning (extension to hot-air balloons & hot-air airships only)
7.3.2.2.	Ballast planning (extension to gas balloons only)
7.3.3.	Pre-flight preparation
7.3.4.	ICAO flight plan (ATS flight plan)
7.3.5.	Flight monitoring and in-flight re-planning
8.	**AIRCRAFT GENERAL KNOWLEDGE, ENVELOPE, SYSTEMS AND EMERGENCY EQUIPMENT**
8.1.	System design, loads, stresses and maintenance
8.2.	Envelope
8.3.1.	Burner (extension to hot-air balloons or hot-air airships only)
8.3.2.	Basket (extension to hot-air balloons or gas balloons only)
8.3.3.	Gondola (extensions to hot-air airships only)
8.4.1	Fuel cylinders (extension to hot-air balloons or hot-air airships only)
8.4.2.	Lifting gas (extension to gas balloons only)
8.5.1.	Ballast (extension to gas balloons only)
8.6.	Fuel (extension to hot-air balloons or hot-air airships only)
8.7.	Instruments
8.8.	Emergency equipment

BFCL.160 BPL – Recency requirements

(a) A BPL holder shall only exercise the privileges of his or her licence if he or she has completed in the relevant balloon class:

(1) either:

(i) within the last 24 months before the planned flight, at least six hours of flight time as PIC, including 10 take-offs and landings, as PIC or flying dual or solo under the supervision of an FI(B); and

(ii) within the last 48 months before the planned flight, at least one training flight with an FI(B); or

(2) within the last 24 months before the planned flight, a proficiency check in accordance with point (c).

(b) In addition to the requirements in paragraph (a), in the case of a pilot who is qualified to fly more than one class of balloons, in order to exercise his or her privileges in the other balloon class or the other balloon classes, he or she shall have completed at least three hours of flight time, as PIC or flying dual or solo under the supervision of an FI(B), on each additional balloon class within the last 24 months.

(c) A BPL holder who does not comply with the requirements in paragraph (a)(1) and, if applicable, (b), before resuming the exercise of his or her privileges, shall pass a proficiency check with an FE(B) in a balloon that represents the relevant class.

(d) After complying with paragraph (a), (b) or (c), as applicable, a BPL holder with privileges to fly hot-air balloons shall exercise his or her privileges only on hot-air balloons that represent:

(1) the same group of hot-air balloons in which the training flight as specified in paragraph (a)(1)(ii) or the proficiency check as specified in paragraph (c), as applicable, have been completed, or a group with a smaller envelope size; or

(2) group A of hot-air balloons in cases where a pilot, in accordance with paragraph (b), has completed the training flight as specified in paragraph (a)(2) in a balloon class other than hot-air balloons.

(e) The completion of the dual flights, the flights under supervision and the training flight as specified in paragraph (a)(1) and (b), as well as the proficiency check as specified in paragraph (c) shall be entered in the logbook of the pilot and signed by, in the case of paragraphs (a)(1) and (b), the responsible FI(B) and, in the case of paragraph (c), the responsible FE(B).

(f) A BPL holder, that holds also the privileges for commercial operations as specified in point BFCL.215 of Subpart ADD of this MCAR, shall be deemed to comply with the requirements of:

(1) paragraph (a) and, if applicable, (b), in case he or she has completed a proficiency check in accordance with point BFCL.215(d)(2)(i) in the relevant balloon class or classes within the last 24 months; or

(2) paragraph (a)(1)(ii), in case he or she has completed the training flight as specified in point BFCL.215(d)(2)(ii) in the relevant balloon class.

In the case of the hot-air balloon class, limitations specified in paragraph (d), concerning the privileges to operate different classes of balloons, shall apply, depending on the balloon class used for complying with paragraphs (f)(1) or (f)(2).

AMC1 BFCL.160 BPL – Recency requirements

CREDITS FOR FLIGHT TIME COMPLETED ON BALLOONS AS PER PART VII OF THE CIVIL AVIATION REGULATIONS

All hours flown on balloons that are subject to regulation 78 of the Civil Aviation Regulations should count in full towards fulfilling the hourly requirements of point BFCL.160 of this Part-BFCL under the following conditions:

(a) the balloon matches the definition and criteria of the respective Part-BFCL balloon class and, in the case of hot-air balloons, the applicable hot-air balloon group as specified in point (a) of point BFCL.010;

(b) a balloon that is used for a training flight with an instructor is an aircraft as per the Civil Aviation Regulations that is subject to an authorisation specified in point ORA.ATO.135 of MCAR-Part-ORA or point DTO.GEN.240 of MCAR-Part-DTO.

AMC1 BFCL.160(a)(1)(ii) Recency requirements

TRAINING FLIGHT

(a) A training flight as stipulated in point BFCL.160(a)(1)(ii) should be a flight that:

(1) follows the content of the skill test for the relevant balloon class, as set out in AMC1 BFCL.145 or AMC1 BFCL.150(c)(2), as applicable; and

(2) is conducted on a one-to-one basis between one pilot and one instructor only, with no other pilot on board who is taking credit for that flight.

(b) Each training flight should be preceded with a briefing and closed with a debriefing between the instructor and the candidate. In order to add value to the training flight, any element of flying a balloon where candidates feel they would benefit from instruction should be discussed. The flight should then be focused on those specific elements with an instructor demonstration prior to candidate practice being performed.

(c) If the instructor considers that the candidate during the training flight did not perform to an adequate standard, they should not sign the logbook of the candidate but recommend further training flights instead.

(d) At the discretion of the flight instructor, non-fare-paying passengers are accepted on board of the balloon during such training flights, provided that:

(1) passengers are made aware that the intended flight will be a training flight; and

(2) abnormal and emergency procedures are practised on the ground and without passengers on board.

(e) The 48-month period should be counted from the last day of the month in which the preceding training flight took place.

AMC1 BFCL.160(a)(2) Recency requirements

PROFICIENCY CHECK

For the proficiency check, the skill test for the initial issue of a BPL in the relevant balloon class, as set out in AMC1 BFCL.145, should be taken.

SUBPART ADD — ADDITIONAL RATINGS

BFCL.200 Tethered hot-air balloon flight rating

(a) A BPL holder shall undertake tethered flights with hot-air balloons only if he or she holds a tethered hot-air balloon flight rating in accordance with this point.

(b) To apply for a tethered hot-air balloon flight rating, the applicant shall:

(1) have privileges for the hot-air balloon class;

(2) first complete at least two tethered hot-air balloon instruction flights.

(c) The completion of the tethered hot-air balloon training shall be entered in the logbook and signed by the FI(B) who is responsible for the training.

(d) A pilot who holds a tethered hot-air balloon flight rating shall exercise his or her privileges only if he or she has completed at least one tethered hot-air balloon flight during the 48 months preceding the planned flight, or, if he or she has not performed such a flight, the pilot shall exercise his or her privileges if they have performed a tethered hot-air balloon flight flying dual or solo under the supervision of an FI(B). The completion of such dual or solo flight under supervision shall be entered in the pilots logbook and signed by the FI(B).

GM1 BFCL.200 Tethered hot-air balloon flight rating

TETHERED ACTIVITY WITHOUT TAKING OFF

A tethered activity where the balloon does not leave the ground is not considered a flight. Such an activity is not eligible to count for initial training or recency for the tethered hot-air balloon flight rating.

AMC1 BFCL.200(b)(2) Tethered hot-air balloon flight rating

FLIGHT INSTRUCTION FOR THE HOT-AIR BALLOON TETHERED FLIGHT RATING

The instruction flights should cover the following training items:

(a) ground preparations;

(b) weather suitability;

(c) tether points:

(1) upwind; and

(2) downwind;

(d) tether ropes (at least a three-point system, as per the applicable flight manual);

(e) maximum all-up-weight limitation;

(f) crowd control;

(g) pre-take-off checks and briefings;

(h) heating for controlled lift off;

(i) 'hands off and hands on' procedure for ground crew;

(j) assessment of lift;

(k) assessment of wind and obstacles;

(l) take-off and controlled climb (at least up to 60 ft (20 m)); and

(m) passenger exchange procedures.

BFCL.210 Night rating

(a) A BPL holder shall exercise the privileges of his or her licence in VFR conditions at night only if he or she holds a night rating in accordance with this point.

(b) An applicant for a night rating shall have completed at least two instruction flights at night of at least one hour each.

(c) The completion of the night rating training shall be entered in the logbook and signed by the FI(B) who is responsible for the training.

AMC1 BFCL.210(b) Night rating

INSTRUCTION FLIGHTS FOR THE NIGHT RATING

The instruction flights should cover the following training items:

(a) medical or physiological aspects of night vision;

(b) flight planning, taking into account the obstacles on the ground, night VMC minima and airspace;

(c) use of lights for assembly, layout and inflation;

(d) requirement for torch to be carried, (pre-flight inspection, etc.);

(e) use of the external and instrument lights;

(f) night take-off procedure;

(g) checklist procedures at night;

(h) emergency procedures at night;

(i) night cross-country techniques, as appropriate;

(j) navigation principles at night;

(k) night landings (emergency procedure in the case of hot-air balloons);

(l) balloon performance (e.g. fuel/ballast consumption) at night; and

(m) map marking for night use (highlighting built-up or lit areas with thicker lines, etc.).

GM1 BFCL.210(c) Night rating

DURATION OF THE NIGHT RATING TRAINING

The two training flights stipulated in point BFCL.210(b) constitute the minimum amount of training needed in the case of experienced pilots. The instructor may conduct additional training flights, as necessary for the candidate to acquire the competence needed for night flying, before entering the completion of training in the candidate's logbook.

BFCL.215 Commercial operation rating

(a) A BPL holder shall exercise the privileges of his or her licence during commercial operations with balloons only if he or she holds a commercial operation rating in accordance with this point.

(b) An applicant for a commercial operation rating shall:

(1) have attained the age of 18 years;

(2) have completed 50 hours of flight time and 50 take-offs and landings as PIC on balloons;

(3) have the privileges for the class of balloon in which the privileges of the commercial operation rating will be exercised; and

(4) have passed a skill test on the relevant class of balloon during which he or she shall demonstrate to an FE(B) the competence required for commercial balloon operations.

(c) The privileges of the commercial operation rating shall be limited to the class of balloon in which the skill test in accordance with paragraph (b)(3) has been completed. The privileges shall be extended upon application to another class of balloon if, in that other class, the applicant complies with paragraph (b)(3) and (b)(4).

(d) A pilot who holds a commercial operation rating shall exercise the privileges of that rating in commercial passenger ballooning only if he or she has completed:

(1) within the 180 days preceding the planned flight:

(i) at least three flights as PIC in balloons, of which at least one shall be in a balloon of the relevant class; or

(ii) one flight as PIC in a balloon of the relevant class under the supervision of an FI(B) who is qualified in accordance with this point; and

(2) within the 24 months preceding the planned flight:

(i) a proficiency check, in a balloon of the relevant class, during which he or she shall demonstrate to an FE(B) the competence required for commercial passenger ballooning; or

(ii) a refresher course at an ATO or a DTO, tailored to the competence required for commercial balloon operations, including at least six hours of theoretical knowledge instruction and one training flight in a balloon of the relevant class with an FI(B) who is qualified for commercial balloon operations in accordance with this point.

(e) To maintain the privileges of the commercial operation rating for all balloon classes, a pilot who holds a commercial operation rating with privileges extended to more than one class of balloons shall comply with the requirements in paragraph (d)(2) in at least one class of balloons.

(f) A pilot who complies with paragraph (d) and holds a commercial operation rating for the hot-air balloon class shall exercise the privileges of that rating in the hot-air balloon class only on balloons that represent:

(i) the same group of the hot-air balloon in which the proficiency check as specified in paragraph (d)(2)(i) or the training flight as specified in paragraph (d)(2)(ii), have been completed; or

(ii) a hot-air balloon group with a smaller envelope size.

(g) The completion of the flight under supervision as specified in paragraph (d)(1)(ii), the proficiency check as specified in paragraph (d)(2)(i) and the refresher training course as specified in paragraph (d)(2)(ii) shall be entered in the logbook of the pilot and shall be signed by the head of training of the ATO or the DTO, or the FI(B) or the FE(B) that is responsible for the training course, the supervision or the proficiency check, as applicable.

(h) A pilot who has completed an operator proficiency check in accordance with point BOP.ADD.315 of Part- BOP to this MCAR shall be deemed to comply with paragraph (d)(2)(i).

AMC1 BFCL.215(b)(4) Commercial operation rating

SKILL TEST FOR THE COMMERCIAL OPERATION RATING

(a) GENERAL

(1) The take-off site should be chosen by the applicant depending on the actual meteorological conditions, the area which has to be overflown, and the possible options for suitable landing sites. The applicant should be responsible for the flight planning and should ensure that all equipment and documentation for the execution of the flight are on board.

(2) The skill test may be conducted in two flights. The total duration of the flight(s) should be at least 45 minutes.

(3) An applicant should indicate to the FE(B) the checks and duties carried out. Checks should be completed in accordance with the flight manual or the authorised checklist for the balloon or hot-air airship on which the test is being taken. During pre-flight preparation for the test, the applicant should be required to perform crew and passenger briefings and demonstrate crowd control. The load calculation should be performed by the applicant in compliance with the operations manual or flight manual for the balloon used.

(b) FLIGHT TEST TOLERANCE

(1) The applicant should demonstrate the ability to:

(i) operate the balloon or hot-air airship within its limitations;

(ii) complete all manoeuvres with smoothness and accuracy;

(iii) exercise good judgment and airmanship;

(iv) apply aeronautical knowledge; and

(v) maintain control of the balloon or the hot-air airship at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

(2) The following limits are for general guidance. The FE(B) should make allowance for turbulent conditions and the handling qualities and performance of the balloon or hot-air airship used:

Height

(i) normal flight: ± 100 ft

(ii) with simulated emergency: ± 150 ft

(c) CONTENT OF THE SKILL TEST

(1) The skill test contents and sections set out in this point should be used for the skill test for the issue of a commercial operation rating in the hot-air balloon class:

Note: Use of checklist(s), airmanship, control of balloon by external visual reference, look-out procedures, etc. apply in all sections.

SECTION 1: PRE-FLIGHT OPERATIONS, INFLATION AND TAKE-OFF	
a	Pre-flight documentation (licence, medical certificate, permits to take off, insurance certificate, aeronautical charts, AFM, logbook, technical logbook, checklists, etc.), flight planning, NOTAM(s) and weather briefing, knowledge of Part-BOP to this MCAR
b	Balloon inspection and servicing, minimum equipment list (MEL)
c	Suitability of launch site
d	Load calculation
e	Crowd control, crew and passenger briefings
f	Assembly and layout
g	Inflation and pre-take-off procedures including passenger involvement and briefing
h	Take-off
i	ATC compliance (if applicable), operation of radio and/or transponder (including emergency procedures)
SECTION 2: GENERAL AIRWORK	
a	Climb to level flight
b	Level flight
c	Descent to level flight
d	Operating at low level
e	ATC compliance (if applicable)
SECTION 3: EN-ROUTE PROCEDURES	
a	Dead reckoning and map reading
b	Marking positions and time
c	Orientation and airspace structure
d	Maintenance of altitude
e	Fuel management
f	Communication with retrieve crew and passengers
g	ATC compliance (if applicable)
SECTION 4: APPROACH AND LANDING PROCEDURES	
a	Approach from low level, missed approach and fly on: Passenger briefing and execution of exercise
b	Approach from high level, missed approach and fly on: Passenger briefing and execution of exercise
c	Pre-landing checks
d	Passenger pre-landing briefing

e	Selection of landing field
f	Final passenger briefing, landing, dragging and deflation
g	ATC compliance (if applicable)
h	Actions after flight (recording of the flight, closing flight plan (if applicable), briefing passengers for packing balloon, contact landowner)
SECTION 5: ABNORMAL AND EMERGENCY PROCEDURES	
This section may be combined with Sections 1 through 4.	
a	Simulated fire on the ground and in the air
b	Simulated pilot light and burner failures
c	Simulated passenger health problems
d	Other abnormal and emergency procedures as outlined in the appropriate flight manual
e	Oral questions

(2) The skill test contents and sections set out in this point should be used for the skill test for the issue of a commercial operation rating in the gas balloon class:

Note: Use of checklist(s), airmanship, control of balloon by external visual reference, look-out procedures, etc. apply in all sections.

SECTION 1: PRE-FLIGHT OPERATIONS, INFLATION AND TAKE-OFF	
a	Pre-flight documentation (licence, medical certificate, permits to take off, insurance certificate, aeronautical charts, AFM, logbook, technical logbook, checklists etc.), flight planning, NOTAM(s) and weather briefing, knowledge of Part-BOP to this MCAR
b	Balloon inspection and servicing, MEL
c	Suitability of launch site
d	Load calculation
e	Crowd control, crew and passenger briefings
f	Assembly and layout
g	Inflation and pre-take-off procedures including passenger involvement and briefing
h	Take-off
i	ATC compliance (if applicable), operation of radio and/or transponder (including emergency procedures)
SECTION 2: GENERAL AIRWORK	
a	Climb to level flight
b	Level flight
c	Descent to level flight
d	Operating at low level
e	ATC compliance (if applicable)
SECTION 3: EN-ROUTE PROCEDURES	
a	Dead reckoning and map reading
b	Marking positions and time

c	Orientation and airspace structure
d	Maintenance of altitude
e	Ballast management
f	Communication with retrieve crew and passengers
g	ATC compliance (if applicable)
SECTION 4: APPROACH AND LANDING PROCEDURES	
a	Approach from low level, missed approach and fly on: Passenger briefing and execution of exercise
b	Approach from high level, missed approach and fly on: Passenger briefing and execution of exercise
c	Pre-landing checks
d	Passenger pre-landing briefing
e	Selection of landing field
f	Final passenger briefing, landing, dragging and deflation
g	ATC compliance (if applicable)
h	Actions after flight (recording of the flight, closing flight plan (if applicable), briefing passengers for packing balloon, contact landowner)
SECTION 5: ABNORMAL AND EMERGENCY PROCEDURES	
This section may be combined with Sections 1 through 4.	
a	Simulated closed appendix during take-off and climb
b	Simulated parachute or valve failure
c	Simulated passenger health problems
d	Other abnormal and emergency procedures as outlined in the appropriate flight manual
e	Oral questions

(3) The skill test contents and sections set out in this point should be used for the skill test for the issue of a commercial operation rating in the hot-air airship class:

Note: Use of checklist(s), airmanship, control of hot air airship by external visual reference, look-out procedures, etc. apply in all sections.

SECTION 1: PRE-FLIGHT OPERATIONS, INFLATION AND TAKE-OFF	
a	Pre-flight documentation (licence, medical certificate, permits to take off, insurance certificate, aeronautical charts, AFM, logbook, technical logbook, checklists etc.), flight planning, NOTAM(s) and weather briefing, knowledge of Part-BOP to this MCAR
b	Hot air airship inspection and servicing, MEL
c	Suitability of launch site
d	Load calculation
e	Crowd control, crew and passenger briefings
f	Assembly and layout
g	Inflation and pre-take-off procedures including passenger involvement and briefing

h	Take-off
i	ATC compliance (if applicable), operation of radio and/or transponder (including emergency procedures)
SECTION 2: GENERAL AIRWORK	
a	Climb to level flight
b	Level flight
c	Turns
d	Stationary flight
e	Descent to level flight
f	Operating at low level
g	ATC compliance (if applicable)
SECTION 3: EN-ROUTE PROCEDURES	
a	Dead reckoning and map reading
b	Marking positions and time
c	Orientation and airspace structure
d	Plotting and steering expected track
e	Maintenance of altitude
f	Fuel management
g	Pressure and engine parameter checks
h	Communication with ground crew
i	ATC compliance (if applicable)
SECTION 4: APPROACH AND LANDING PROCEDURES	
a	Approach, missed approach and go-around
b	Pre-landing checks
c	Selection of landing field
d	Landing and deflation
e	ATC compliance (if applicable)
f	Actions after flight (recording of the flight, closing flight plan (if applicable), briefing passengers for packing balloon, contact landowner)
SECTION 5: ABNORMAL AND EMERGENCY PROCEDURES	
This section may be combined with Sections 1 through 4.	
a	Simulated fire on the ground and in the air
b	Simulated pilot light, burner and engine failures
c	Approach with simulated engine failure, missed approach and go-around
d	Simulated passenger health problems
e	Other abnormal and emergency procedures as outlined in the appropriate flight manual
f	Oral questions

AMC1 BFCL.215(d)(1)(i) Commercial operation rating

CRITERIA FOR RECENCY FLIGHTS AS PIC

(a) In order to count as a flight in terms of point BFCL.215(d)(1)(i), the flight should:

(1) have a duration of at least 10 minutes;

(2) reach the minimum standard flight altitude as per ROA.405 of MCAR-Part-ROA; and

(3) be completed by a full stop of the basket on the ground.

(b) Every flight phase that complies with points (1) to (3) of point (a) during a single balloon operation should be deemed as a separate flight.

AMC1 BFCL.215(d)(2)(i) Commercial operation rating

PROFICIENCY CHECK

(a) For the proficiency check as per point BFCL.215(d)(2)(i), the content of the skill test for initial issue of the commercial operation rating as set out in AMC1 BFCL.215(b)(4) should be used. Additionally, the examiner should assess the candidate's knowledge of recent aeronautical information circulars (AICs) and NOTAMs.

(b) The proficiency check may be conducted during a commercial passenger ballooning (CPB) operation, provided that abnormal and emergency procedures are simulated before or after the flight on the ground without passengers on board.

AMC1 BFCL.215(d)(2)(i); BFCL.215(h) Commercial operation rating

CREDITS FOR A PROFICIENCY CHECK IN ACCORDANCE WITH Part-BOP to this MCAR

The holder of a commercial operation rating should be deemed to comply with point BFCL.215(d)(2)(i) as long as the latest operator proficiency check completed in accordance with point BOP.ADD.315 Part-BOP to this MCAR is still valid, provided that this operator proficiency check included procedures for commercial passenger ballooning.

AMC1 BFCL.215(d)(2)(ii) Commercial operation rating

REFRESHER COURSE

(a) THEORETICAL KNOWLEDGE INSTRUCTION

The 6 hours of theoretical knowledge instruction should include at least all of the following:

(1) Evaluation of passengers:

(i) assessment of fitness of passengers;

(ii) criteria to decline to carry a passenger; and

(iii) special factors for disabled or limited mobility passengers;

(2) Passenger briefings:

(i) use of briefing cards;

(ii) pre-inflation briefing;

(iii) pre-launch briefing; and

(iv) pre-landing briefing;

(3) Passenger embarkation:

(i) procedures for safe embarkation;

(ii) use of ground crew to assist with embarkation;

(iii) positioning of passengers in the basket for weight, balance and management; and

(iv) factors concerning passengers' personal property;

(4) Passenger care for landing:

(i) use of seats where fitted;

(ii) stowage of passengers' personal equipment; and

(iii) special factors in case of more than 19 passengers on board, in which case an additional crew member is required in accordance with point BOP.ADD.410 of Part-BOP to this MCAR;

(5) Emergency procedures:

(i) fire in the air;

(ii) fire on the ground;

(iii) fuel system failures;

(iv) deflation system failures;

(v) fast landing;

(vi) hard landing; and

(vii) passenger incapacitation in flight; and

(6) Documentation:

(i) loading calculation;

(ii) fuel calculation;

(iii) completion of passenger manifest; and

(iv) dealing with last-minute changes.

(b) TRAINING FLIGHT

(1) A training flight as stipulated in point BFCL.215(d)(2)(ii) should be a flight that:

(i) follows the content of the skill test for initial issue of the commercial operation rating as set out in AMC1 BFCL.215(b)(4); and

(ii) is conducted on a one-to-one basis between one pilot and one instructor only, with no other pilot on board who is taking credit for that flight.

(2) Each training flight should be preceded with a briefing and closed with a debriefing between the instructor and the candidate. In order to add value to the training flight, any element of flying a balloon where candidates feel they would benefit from instruction should be discussed. The flight should then be focused on those specific elements with an instructor demonstration prior to candidate practice being performed.

(3) The training flight may be conducted during CPB operation, provided that:

(i) abnormal and emergency procedures are simulated before or after the flight on the ground without passengers on board; and

(ii) passengers are made aware that the intended flight will be a training flight.

SUBPART FI — FLIGHT INSTRUCTORS

SECTION 1 – GENERAL REQUIREMENTS

BFCL.300 Flight instructor certificates

(a) General

An instructor shall only carry out flight instruction in a balloon if he or she:

(1) holds:

(i) a BPL including the privileges, ratings and certificates for which flight instruction is to be provided; and

(ii) a balloon flight instructor (FI(B)) certificate appropriate to the instruction carried out, and issued in accordance with this Subpart; and

(2) is entitled to act as PIC in the balloon during flight instruction.

(b) Instruction provided outside Mauritius

(1) By way of derogation from subparagraph (a)(1), in the case of flight instruction provided during a training course approved in accordance with this MCAR outside Mauritius, the Authority shall issue a flight instructor certificate to an applicant who holds a balloon pilot licence that is compliant with Annex 1 to the Chicago Convention, provided that the applicant:

(i) holds at least a licence including, where relevant, privileges, ratings or certificates equivalent to those for which he or she is authorised to instruct;

(ii) complies with the requirements established in this Subpart for the issue of the FI(B) certificate with the relevant instructional privileges; and

(iii) demonstrates to the Authority an adequate level of knowledge of aviation safety rules to be able to exercise his or her instructional privileges in accordance with this MCAR.

(2) The certificate shall be limited to the provision of approved flight instruction:

(i) in Mauritius; and

(ii) to a student pilot who has sufficient knowledge of the language in which flight instruction is provided.

SECTION 2 – FLIGHT INSTRUCTOR CERTIFICATE FOR BALLOONS – FI(B)

BFCL.315 FI(B) certificate – Privileges and conditions

(a) Subject to compliance of applicants with point BFCL.320 and with the following conditions, an FI(B) certificate shall be issued with privileges to conduct flight instruction for:

(1) a BPL;

(2) the extension of privileges to further classes and groups of balloons provided that the applicant has completed at least 15 hours of flight time as PIC in each relevant class;

(3) a night rating or a tethered flight rating, provided that the applicant has received specific training in providing instruction for the relevant rating at an ATO or at a DTO; and

(4) an FI(B) certificate, provided that the applicant has:

(i) completed at least 50 hours of flight instruction on balloons; and

(ii) in accordance with the procedures established for that purpose by the Authority, conducted at least one hour of flight instruction for the FI(B) certificate under the supervision and to the satisfaction of an FI(B) who is qualified in accordance with this subparagraph and nominated by the head of training of the ATO or the DTO.

(b) The privileges listed in paragraph (a) shall include the privileges to conduct flight instruction for:

(1) the issue of the relevant licence, privileges, ratings or certificate; and

(2) the revalidation, renewal or compliance with the relevant recency requirements of this MCAR, as applicable.

AMC1 BFCL.315(a)(4)(ii) FI(B) certificate – Privileges and conditions

ADDITIONAL TRAINING REQUIRED BEFORE INSTRUCTING DURING FI(B) TRAINING COURSES

The 1 hour of flight instruction, as required in point BFCL.315(a)(4)(ii), should consist of exercises from the FI(B) training course, as selected by the supervising FI(B), and should, in any case, include all of the following:

(a) one take-off and one landing exercise;

(b) a selection of flight exercises; and

(c) one emergency exercise.

BFCL.320 FI(B) – Prerequisites and requirements

Applicants for an FI(B) certificate shall:

(a) be at least 18 years of age;

(b) comply with the requirements of subparagraphs (a)(1)(i) and (a)(2) of point BFCL.300;

(c) have completed 75 hours of balloon flight time as PIC;

(d) have completed an instructor training course in accordance with point BFCL.330 at an ATO or a DTO; and

(e) have passed an assessment of competence in accordance with point BFCL.345.

BFCL.325 FI(B) competencies and assessment

Applicants for an FI(B) certificate shall be trained to achieve the following competencies:

(a) prepare resources;

(b) create a climate conducive to learning;

(c) present knowledge;

(d) integrate threat and error management (TEM) and crew resource management (CRM);

(e) manage time to achieve training objectives;

(f) facilitate learning;

(g) assess trainee performance;

(h) monitor and review progress;

(i) evaluate training sessions; and

(j) report outcome.

AMC1 BFCL.325 FI(B) competencies and assessment

(a) Training should be both theoretical and practical. Practical elements should include the development of specific instructor skills, particularly in the area of teaching and assessing TEM.

(b) The training and assessment of instructors should be made against the following performance standards:

Competency	Performance	Knowledge/understanding of
Prepare resources	(a) ensures adequate facilities; (b) prepares briefing material; (c) manages available tools.	(a) objectives; (b) available tools; (c) competency-based training methods.
Create a climate conducive to learning	(a) establishes credentials, role models appropriate behaviour; (b) clarifies roles; (c) states objectives; (d) ascertains and supports student pilot's needs.	(a) barriers to learning; (b) learning styles.
Present knowledge	(a) communicates clearly; (b) creates and sustains realism; (c) looks for training opportunities.	teaching methods
Integrate human factors and TEM	makes human factors and TEM links with technical training.	(a) human factors and TEM; (b) causes and countermeasures against undesired aircraft states.
Manage time to achieve training objectives	allocates the appropriate time to achieve the competency objective.	syllabus time allocation
Facilitate learning	(a) encourages trainee participation; (b) shows motivating, patient, confident and assertive manner; (c) conducts one-to-one coaching; (d) encourages mutual support.	(a) facilitation; (b) how to give constructive feedback; (c) how to encourage trainees to ask questions and seek advice.
Assesses trainee performance	(a) assesses and encourages trainee self-assessment of performance against competency standards;	(a) observation techniques; (b) methods for recording observations.

	(b) makes assessment decision and provides clear feedback; (c) observes crew-resource management (CRM) behaviour.	
Monitor and review progress	(a) compares individual outcomes to defined objectives; (b) identifies individual differences in learning rates; (c) applies appropriate corrective action.	(a) learning styles; (b) strategies for training adaptation to meet individual needs.
Evaluate training sessions	(a) elicits feedback from student pilots; (b) tracks training session processes against competency criteria; (c) keeps appropriate records.	(a) competency unit and associated elements; (b) performance criteria.
Report outcome	Reports accurately using only observed actions and events.	(a) training phase objectives; (b) individual versus systemic weaknesses.

BFCL.330 FI(B) – Training course

(a) Applicants for an FI(B) certificate shall first pass a specific pre-entry assessment at an ATO or a DTO within the 12 months preceding the start of the training course, to assess his or her ability to take the course.

(b) The FI(B) training course shall include at least:

(1) the elements specified in point BFCL.325;

(2) 25 hours of teaching and learning;

(3) 12 hours of theoretical knowledge instruction, including progress tests; and

(4) three hours of flight instruction, including three take-offs and landings.

(c) Applicants who already hold an instructor certificate in accordance with MCAR-Part-SFCL or with MCAR-Part-FCL shall be fully credited towards the requirement in paragraph (b)(2).

AMC1 BFCL.330(a) FI(B) – Training course

PRE-ENTRY ASSESSMENT

The content of the pre-entry assessment should be determined by the ATO or the DTO, taking into account the experience of a particular candidate. It may include interviews and/or an assessment during a simulated training session with the candidate.

AMC1 BFCL.330(b) FI(B) – Training course

(a) GENERAL

(1) The aim of the FI(B) training course is to train BPL holders to the level of competence defined in point BFCL.325.

(2) Throughout the training course, its content and structure should allow the student instructor to develop safety awareness by teaching the knowledge, skills and attitudes relevant to the FI(B) task including at least the following:

(i) refresh the technical knowledge of the student instructor;

(ii) train the student instructor to teach:

(A) the ground subjects and air exercises; and

(B) how to access all related sources of information;

(iii) ensure that the student instructor's flying is of a sufficiently high standard; and

(iv) teach the student instructor the principles of basic instruction and how to apply them at all training levels.

(3) With the exception of the section on teaching and learning, all the subject details contained in the ground and flight training syllabus is complementary to the BPL course syllabus.

(4) The FI(B) training course should give particular stress to the role of the individual in relation to the importance of human factors in the man-machine interface as well as in the instructor-student interaction during theoretical knowledge instruction. Special attention should be paid to the applicant's maturity and judgement including an understanding of adults, their behavioural attitudes and variable levels of education.

(5) During the training course, applicants should be made aware that their own attitudes are key to flight safety. Identifying and avoiding complacency and improving safety awareness should be a fundamental objective throughout the training course. It is of major importance for the

training course to aim at giving applicants the knowledge, skills and attitudes relevant to a flight instructor's task.

(b) STRUCTURE AND CONTENT

The training course consists of two parts:

(1) PART 1 — THEORETICAL KNOWLEDGE INSTRUCTION

Part 1 includes the training specified in points (2) and (3) of point BFCL.330(b).

The content of the teaching and learning part of the FI(B) course, as established in AMC1 BFCL.325, should be used as guidance to develop the syllabus for the training specified in point BFCL.330(b)(2).

(2) PART 2 — FLIGHT INSTRUCTION

Part 2 includes the training specified in point BFCL.330(b)(4).

(i) General

(A) The air exercises are similar to those of the BPL training course but with additional items designed to cover the needs of a flight instructor.

(B) The numbering of exercises should be used primarily as an exercise reference list and as a broad instructional sequencing guide. Therefore, the demonstrations and practices need not necessarily be given in the order listed. The actual order and content will depend upon the following interrelated factors:

(a) the applicant's progress and ability;

(b) the weather conditions affecting the flight;

(c) the flight time available;

(d) the instructional technique considerations;

(e) the local operating environment; and

(f) the applicability of the exercises to the aircraft type.

(C) At the discretion of the instructors, some of the exercises may be combined whereas some other exercises may be done in several flights.

(D) It follows that student instructors will eventually be faced with similar inter-related factors. They should be shown and taught how to develop flight lesson plans, taking these

factors into account, so as to make the best use of each flight lesson, combining parts of the set exercises as necessary.

(ii) Briefings and debriefings

(A) The briefing normally includes a statement of the aim and a brief allusion to principles of flight only if relevant. An explanation is to be given of exactly which air exercises are to be taught by the instructor and practised by the student during the flight. It should include how the flight will be conducted with regard to who is to fly the aircraft and what airmanship, weather and flight safety aspects currently apply. The nature of the lesson will govern the order in which the constituent parts are to be taught.

(B) The five basic components of the briefing will be:

(a) the aim;

(b) the air exercise(s) (what, how and by whom);

(c) flight briefing;

(d) check of understanding; and

(e) airmanship.

(C) After each exercise, the student instructor will conduct a debriefing of the pilot who acted as the student pilot during the training flight, be it the FI(B) instructor or an additional pilot (as described in point (k)(2)). The debriefing is to evaluate:

(a) whether the objectives have been fulfilled;

(b) whether the errors are minor or major;

(c) what can be corrected or improved; and

(d) whether the student pilot has reached the required level of competence or the exercise must be done again.

The FI(B) instructor will validate the debriefing.

(iii) Planning of flight lessons

The development of lesson plans is an essential prerequisite of good instruction and the student instructor is to be given supervised practice in the development and practical application of flight lesson plans.

(iv) General considerations

(A) The student instructor should complete flight training in order to practise the principles of basic instruction at the BPL level.

(B) The instructor providing this instructor training may take over the role of the student pilot. An additional person holding a BPL or a student pilot for the BPL may be on board in order to act as a student pilot under the supervision of the student instructor.

(C) It is to be noted that airmanship is a vital ingredient of all flight operations. Therefore, in the following air exercises, the relevant aspects of airmanship are to be stressed at the appropriate times during each flight.

(D) The student instructor should learn how to identify common errors and how to correct them properly, which should be emphasised at all times.

(v) Long briefings and air exercises

Exercise 1: Familiarisation with the balloon

(a) Objective

To advise the student instructor on how to familiarise the student with the balloon which will be used for the training and to test the student's position in the basket for comfort, visibility, and ability to use all controls and equipment. Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.

(b) Briefing and exercise

The student instructor has to:

(1) present the type of balloon which will be used;

(2) explain the characteristics of the balloon;

(3) explain the components, instruments and equipment;

(4) explain the re-fuelling procedures (in the case of hot-air balloons);

(5) familiarise the student with the balloon controls; and

(6) explain all checklists, drills and controls.

(c) Debriefing

Exercise 2: Preparation for the flight

(a) Objective

To advise the student instructor on how to explain all the operations and the necessary preparation to be completed before the flight. Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.

(b) Briefing

The student instructor has to explain:

(1) the need for a pre-flight briefing;

(2) the structure and the content of this briefing;

(3) which documents are required on board;

(4) which equipment is required for a flight;

(5) the use of weather forecasts or actuals;

(6) the flight planning with particular regard to NOTAMs, airspace structure, sensitive areas, expected track and distance, pre-flight picture and possible landing fields;

(7) the use of load calculation chart; and

(8) the selection of a launch field with particular regard to permission, behaviour and adjacent fields.

(c) Exercise

The student instructor has to prepare and give a pre-flight briefing during which they have to demonstrate:

(1) that the required documents are on board;

(2) that the equipment required for the intended flight is on board;

(3) how to perform a load calculation;

(4) how to advise the student to do the pre-planning procedures for each flight;

(5) how to perform a pre-launch check;

(6) how to select a launch field with particular regard to permission, behaviour and adjacent fields;

(7) how to teach the student pilot to perform the preparation to be completed prior to flight; and

(8) how to analyse and correct errors of the student pilot as necessary.

(d) Debriefing

Exercise 3: Crew and passenger briefing

(a) Objective

To advise the student instructor on how to explain the importance of appropriate clothing for pilot, passengers and crew and how to perform the briefing of ground and retrieve crew and the briefing of passengers. Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.

(b) Briefing

The student instructor has to explain:

(1) the appropriate clothing for passengers and crew; and

(2) the briefings for ground and retrieve crew and passengers.

(c) Exercise:

The student instructor has to demonstrate:

(1) how to advise the passengers and crew about the correct clothing;

(2) the briefing of ground and retrieve crew;

(3) the briefing of passengers;

(4) how to familiarise the student pilot with the different type of briefings; and

(5) how to analyse and correct errors of the student pilot.

(d) Debriefing

Exercise 4: Assembly and layout

(a) Objective

To advise the student instructor on how to familiarise the student pilot on crowd control and how to perform the securing of the launch site. Furthermore, the student instructor has to demonstrate how to familiarise the student pilot with the correct rigging of envelope and basket, the burner test procedure (hot-air balloons) and the pre-inflation checks. Finally, the student instructor should learn how to identify student errors and how to correct them properly.

(b) Briefing

The student instructor has to explain:

(1) the crowd control;

(2) the securing of the launch site;

(3) the correct rigging procedure;

(4) the use of the restraint line; and

(5) the pre-inflation checks and use of checklist(s).

(c) Exercise

The student instructor has to demonstrate:

(1) the crowd control and securing of launch site;

(2) the correct rigging of envelope and basket;

(3) the correct use of the restraint line;

(4) the burner test procedure (hot-air balloons);

(5) the pre-inflation checks and correct use of checklist(s);

(6) how to teach the student pilot to perform the correct rigging; and

(7) how to analyse and correct assembly errors of the student pilot as necessary.

(d) Debriefing

Exercise 5: Inflation

(a) Objective

To advise the student instructor on how to familiarise the student pilot with the different phases of the inflation procedure, the use of restraint line and inflation fan (hot-air balloons) and the avoidance of electrostatic discharge (gas balloons). Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.

(b) Briefing

The student instructor has to explain:

(1) the different phases of the inflation procedure;

(2) the crowd control and securing procedures during inflation;

(3) the use of the inflation fan (hot-air balloons); and

(4) how to avoid electronic discharge (gas balloons).

(c) Exercise

The student instructor has to demonstrate:

(1) the crowd control and securing of the launch site during inflation procedure;

(2) the cold inflation procedure and use of restraint line and inflation fan (hot-air balloons);

(3) the hot inflation procedure (hot-air balloons);

(4) the avoidance of electrostatic discharge (gas balloons);

(5) the inflation procedure (gas balloons);

(6) how to teach the student pilot to perform the inflation procedures; and

(7) how to analyse and correct errors of the student pilot during the inflation procedure as necessary.

(d) Debriefing

Exercise 6: Take-off in different wind conditions

(a) Objective

To advise the student instructor how to explain the pre take-off checks and briefings, the preparation for controlled climb and the use of restraint equipment. Furthermore, the student instructor should be able to demonstrate the assessment of wind and obstacles, the preparation for false lift and the take-off techniques in different wind conditions. In addition to this, the student instructor should learn how to identify student errors and how to correct them properly.

(b) Briefing

The student instructor has to explain:

(1) the pre take-off checks and briefings;

(2) the preparation for controlled climb;

(3) the 'hands off and hands on' procedure for ground crew;

(4) the assessment of lift;

(5) the use of the restraint equipment;

(6) the assessment of wind and obstacles;

(7) the preparation for false lift; and

(8) the take-off techniques from sheltered and non-sheltered launch fields.

(c) Air exercise

The student instructor has to demonstrate:

(1) how to perform the pre take-off checks and briefings;

(2) how to prepare for controlled climb;

(3) how to perform the 'hands off and hands on' procedure for ground crew;

(4) how to perform the assessment of lift without endangering the ground crew;

(5) how to use the restraint equipment;

(6) how to perform the assessment of wind and obstacles;

(7) how to prepare for false lift;

(8) how to teach the student pilot the correct take off techniques from sheltered and non-sheltered launch fields; and

(9) how to analyse and correct errors of the student pilot as necessary.

(d) Debriefing

Exercise 7: Climb to level flight

(a) Objective

To advise the student instructor on how to explain and demonstrate the climb to flight level. Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.

(b) Briefing

The student instructor has to explain:

(1) the climbing with a predetermined rate of climb;

(2) the effect on envelope temperature (hot-air balloons);

(3) the maximum rate of climb according to the manufacturer's flight manual; and

(4) how to level off at a selected altitude.

(c) Air exercise

The student instructor has to demonstrate:

(1) how to climb with a predetermined rate of climb;

(2) how to perform look-out techniques;

(3) the effect on envelope temperature (hot-air balloons);

(4) the maximum rate of climb according to the manufacturer's flight manual;

(5) the levelling off techniques at a selected altitude;

(6) how to advise the student pilot to perform the climb to level flight;

(7) how to analyse and correct faults or errors of the student pilot during the climb.

(d) Debriefing

Exercise 8: Level flight

(a) Objective

To advise the student instructor on how to explain and demonstrate level flight. Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.

(b) Briefing

The student instructor has to explain:

(1) how to maintain level flight by use of instruments;

(2) how to maintain level flight by use of visual references;

(3) how to maintain level flight by use of all available means;

(4) the use of parachute; and

(5) the use of turning vents, if installed (hot -air balloons).

(c) Air exercise

The student instructor has to demonstrate:

(1) how to maintain level flight by use of instruments;

(2) how to maintain level flight by use of visual references;

(3) how to maintain level flight by use of all available means;

(4) the use of parachute;

(5) the use of turning vents, if installed (hot-air balloons);

(6) how to advise the student pilot to perform the level flight; and

(7) how to analyse and correct faults or errors of the student pilot during the level flight.

(d) Debriefing

Exercise 9: Descent to level flight

(a) Objective

To advise the student instructor on how to explain and demonstrate the descent to a certain flight level. Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.

(b) Briefing

The student instructor has to explain:

(1) how to descend with a predetermined rate of descent;

(2) a fast descent;

(3) the maximum rate of descent according to the manufacturer's flight manual;

(4) the use of parachute;

(5) a parachute stall and cold descent (hot-air balloons); and

(6) the levelling off technique at selected altitude.

(c) Air exercise

The student instructor has to demonstrate:

(1) a descent with a predetermined rate of descent;

(2) how to perform look-out techniques;

(3) a fast descent;

(4) the maximum rate of descent according to the manufacturer's flight manual;

(5) the use of parachute;

(6) how to level off at selected altitudes;

(7) how to advise the student pilot to perform a descent to a certain flight level; and

(8) how to analyse and correct faults or errors of the student pilot during the descent.

(d) Debriefing

Exercise 10: Emergencies

(a) Objective

To advise the student instructor on how to explain and demonstrate the different emergency situations and how to react. Furthermore, the student instructor should learn how to identify student errors during the simulated emergency exercises and how to correct them properly.

(b) Briefing

The student instructor has to explain:

(1) the pilot light failure (hot-air balloons);

(2) burner failures, valve leaks, flame out and re-light (hot-air balloons);

(3) the gas leaks (gas balloons);

(4) the closed appendix during take-off and climb (gas balloons);

(5) the envelope over temperature (hot-air balloons);

(6) the envelope damage in flight;

(7) the parachute or rapid deflation system failure;

(8) the fire on ground and in the air;

(9) how to avoid an obstacle contact including contact with electrical power lines; and

(10) escape drills, location and use of emergency equipment.

(c) Air exercise

The student instructor has to demonstrate (in the air or during a simulation on the ground):

(1) a pilot light failure (hot-air balloons);

(2) a burner failure, valve leaks, flame out and re-light (hot-air balloons);

(3) the gas leaks;

(4) a closed appendix during take-off and climb (gas balloons);

(5) the envelope over temperature (hot-air balloons);

(6) the envelope damage in flight;

(7) the parachute or rapid deflation system failure;

(8) a fire on ground and in the air;

(9) the escape drills, location and use of emergency equipment;

(10) how to advise the student pilot in performing the different emergency drills; and

(11) how to analyse and correct faults or errors of the student pilot.

(d) Debriefing

Exercise 11: Navigation

(a) Objective

To advise the student instructor on how to explain and demonstrate the advanced navigational flight preparation. Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.

(b) Briefing

The student instructor has to explain:

(1) the maps selection;

(2) the plotting of the expected track;

(3) the marking of positions and time;

(4) the calculation of distance and speed;

(5) the calculation of fuel consumption (hot-air balloons);

(6) the calculation of ballast consumption (gas balloons);

(7) the ceiling limitations (ATC or weather);

(8) how to plan ahead;

(9) the monitoring of weather development;

(10) the monitoring of fuel or ballast consumption;

(11) ATC liaison (if applicable);

(12) the communication with retrieve crew; and

(13) the use of GNSS (if applicable).

(c) Air exercise

The student instructor has to demonstrate:

(1) the use of selected maps;

(2) the plotting of the expected track;

(3) the marking of positions and time;

(4) how to monitor distance and speed;

(5) how to monitor the fuel or ballast consumption;

(6) the observance of ceiling limitations (ATC or weather);

(7) the planning ahead;

(8) the monitoring of weather development;

(9) the monitoring of envelope temperature (hot-air balloons);

(10) the ATC liaison (if applicable);

(11) the communication with retrieve crew;

(12) the use of GNSS (if applicable);

(13) how to advise the student pilot on performing the navigational preparation;

(14) how to advise the student pilot on performing the different navigational in-flight tasks; and

(15) how to analyse and correct faults or errors of the student pilot.

(d) Debriefing

Exercise 12a: Fuel management (hot-air balloons)

(a) Objective

To advise the student instructor on how to explain and demonstrate the fuel management techniques. Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.

(b) Briefing

The student instructor has to explain:

(1) the cylinder arrangement and the burner systems;

(2) the function of the pilot light supply (vapour or liquid);

(3) the use of master cylinders (if applicable);

(4) the fuel requirement and expected fuel consumption;

(5) the fuel state and pressure;

(6) the minimum fuel reserves;

(7) cylinder contents gauge and change procedure; and

(8) the use of cylinder manifolds (if applicable).

(c) Air exercise

The student instructor has to demonstrate:

(1) the cylinder arrangement and burner systems;

(2) the pilot light supply (vapour or liquid);

(3) the use of master cylinders (if applicable);

(4) how to monitor the fuel requirement and expected fuel consumption;

(5) the monitoring of fuel state and pressure;

(6) the monitoring of fuel reserves;

(7) the use of cylinder contents gauge and change procedure;

(8) the use of cylinder manifolds (if applicable);

(9) how to advise the student pilot to perform the fuel management; and

(10) how to analyse and correct faults or errors of the student pilot.

(d) Debriefing

Exercise 12b: Ballast management (gas balloons)

(a) Objective

To advise the student instructor on how to explain and demonstrate the ballast management. Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.

(b) Briefing

The student instructor has to explain:

(1) the minimum ballast;

(2) the arrangement and securing of ballast;

(3) the ballast requirement and expected ballast consumption; and

(4) the ballast reserves.

(c) Air exercise

The student instructor has to demonstrate:

(1) the determination of the minimum ballast requirement;

(2) the arrangement and securing of ballast;

(3) the ballast requirement calculation and expected ballast consumption;

(4) how to secure ballast reserves;

(5) how to advise the student pilot to perform the ballast management; and

(6) how to analyse and correct faults or errors of the student pilot.

(d) Debriefing

Exercise 13: Approach from low level

(a) Objective

To advise the student instructor on how to explain and demonstrate the approach from level. Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.

(b) Briefing

The student instructor has to explain:

(1) pre-landing checks;

(2) the passenger pre-landing briefing;

(3) the selection of fields;

(4) the use of burner and parachute (hot-air balloons);

(5) the use of ballast or parachute and valve (gas balloons);

(6) the use of trail rope (if applicable) (gas balloons);

(7) look-out procedures; and

(8) missed approach and fly-on procedures.

(c) Air exercise

The student instructor has to demonstrate:

(1) the use of the pre landing checks;

(2) the selection of fields;

(3) the use of burner and parachute (hot-air balloons);

(4) the use of ballast or parachute and valve (gas balloons);

(5) the use of trail rope (if applicable) (gas balloons);

(6) the look-out procedures and how to avoid possible distractions;

(7) the missed approach and fly-on techniques;

(8) how to advise the student pilot to perform an approach from low level; and

(9) how to analyse and correct faults or errors of the student pilot.

(d) Debriefing

Exercise 14: Approach from high level

(a) Objective

To advise the student instructor on how to explain and demonstrate the approach from high level. Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.

(b) Briefing

The student instructor has to explain:

(1) the pre-landing checks;

(2) the passenger pre-landing briefing;

(3) selection of field;

(4) the rate of descent;

(5) the use of burner and parachute (hot-air balloons);

(6) the use of ballast and parachute (gas balloons);

(7) the use of trail rope (if applicable) (gas balloons);

(8) look-out procedures; and

(9) missed approach and fly-on procedures.

(c) Air exercise

The student instructor has to demonstrate:

(1) the pre-landing checks;

(2) the selection of field;

(3) the rate of descent;

(4) the use of burner and parachute (hot-air balloons);

(5) the use of ballast and parachute (gas balloons);

(6) the use of trail rope (if applicable) (gas balloons);

(7) the look-out procedures and how to avoid potential distraction;

(8) the missed approach and fly-on techniques;

(9) how to advise the student pilot to perform an approach from a higher level; and

(10) how to analyse and correct faults or errors of the student pilot.

(d) Debriefing

Exercise 15: Operation at low level

(a) Objective

To advise the student instructor on how to explain and demonstrate the operation at a low height (1-20 metres). Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.

(b) Briefing

The student instructor has to explain:

(1) the use of burner and parachute (hot-air balloons);

(2) the use of ballast and parachute (gas balloons);

(3) the look-out procedures;

(4) how to avoid a contact with low-level obstacles;

(5) how to avoid sensitive areas (for example, nature protection areas); and

(6) the landowner relations.

(c) Air exercise

The student instructor has to demonstrate:

(1) the use of burner and parachute (hot-air balloons);

(2) the use of ballast and parachute (gas balloons);

(3) look-out procedures and how to avoid potential distraction;

(4) how to avoid low-level obstacles;

(5) good landowner relations;

(6) how to advise the student pilot to operate the balloon at a low level; and

(7) how to analyse and correct faults or errors of the student pilot.

(d) Debriefing

Exercise 16: Landing in different wind conditions

(a) Objective

To advise the student instructor on how to explain and demonstrate landings in different wind conditions. Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.

(b) Briefing

The student instructor has to explain:

(1) the correct actions for turbulences during the approach or landing;

(2) the passenger pre-landing briefing;

(3) the use of burner and pilot lights (hot-air balloons);

(4) the use of ballast, parachute, valve and rip panel (gas balloons);

(5) the use of parachute and turning vents (if applicable);

(6) look-out;

(7) the landing, dragging and deflation;

(8) the use of drop line; and

(9) landowner relations.

(c) Air exercise

The student instructor has to demonstrate:

(1) the pre-landing checks;

(2) the passenger briefing;

(3) the selection of field;

(4) the effect of turbulence;

(5) the use of burner and pilot lights (hot-air balloons);

(6) the use of ballast, parachute, valve and rip panel (gas balloons);

(7) the use of parachute rapid deflation systems (if applicable) and turning vents (if applicable) (hot-air balloons);

(8) the look-out procedures and how to avoid potential distraction;

(9) the landing, dragging and deflation procedures;

(10) the use of drop line (when appropriate)

(11) how to advise the student pilot to perform a safe landing in different wind conditions; and

(12) how to analyse and correct faults or errors of the student pilot.

(d) Debriefing

Exercise 17: First solo flight

(a) Objective

To advise the student instructor on how to prepare students for the first solo flight. Furthermore, the student instructor should learn how to properly assess the readiness and fitness of a student to fly solo on the day of the intended solo flight.

(b) Briefing

The student instructor has to explain:

(1) the limitations of the flight;

(2) the use of required equipment; and

(3) the flight planning and references to manoeuvres.

(c) Air exercise

The student instructor has to:

(1) evaluate whether the student should be authorised to fly solo, taking into consideration at least all of the following:

(i) the experience of the student;

(ii) the physical and mental fitness of the student;

(iii) weather conditions; and

(iv) the suitability of balloons for a solo flight;

(2) monitor the pre-flight preparation;

(3) brief the student (expected flight time or emergency actions);

(4) monitor the flight as far as possible; and

(5) debrief the flight with the student.

(d) Debriefing

Exercise 18: Tethered flight (hot-air balloons)

Note: This exercise constitutes the specific training referred to in point BFCL.315(a)(3) regarding instructional privileges for the tethered flight rating. It may be completed during the initial FI(B) training course or as a separate training, provided that the applicant holds the tethered flight rating.

(a) Objective

To advise the student instructor on how to explain and demonstrate the tethering techniques. Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.

(b) Briefing

The student instructor has to explain:

(1) the ground preparations;

(2) the weather suitability;

(3) the tethering techniques and equipment;

(4) the maximum all-up-weight limitation;

(5) crowd control;

(6) the pre-take-off checks and briefings;

(7) the heating for controlled lift-off;

(8) the 'hands-off and hands-on' procedure for ground crew;

(9) the procedures for boarding and disembarking passengers;

(10) the assessment of wind and obstacles; and

(11) the controlled climb to a pre-defined altitude (at least 60 ft (20 m)).

(c) Air exercise

The student instructor has to demonstrate:

(1) the ground preparations;

(2) the tethering techniques;

(3) the understanding of maximum all-up-weight limitation;

(4) how to perform crowd control;

(5) the pre-take-off checks and briefings;

(6) the heating for controlled lift-off;

(7) the 'hands-off and hands-on' procedure for ground crew;

(8) the passenger boarding and disembarkation; exchange of passengers between flights

(9) the assessment of wind and obstacles;

(10) the controlled climb;

(11) the landing techniques;

(12) how to advise the student pilot on how to perform a tethered flight; and

(13) how to analyse and correct faults or errors of the student pilot.

(d) Debriefing

Exercise 19: Night flying

Note: This exercise constitutes the specific training referred to in point BFCL.315(a)(3) regarding instructional privileges for the night rating. It may be completed during the initial FI(B) training course or as a separate training, provided that the applicant holds the night rating.

(a) Objective

To advise the student instructor on how to explain and demonstrate the night flying techniques. Furthermore, the student instructor should learn how to identify student errors and how to correct them properly.

(b) Briefing

The student instructor has to explain:

(1) the medical or physiological aspects of night vision;

(2) the flight planning, taking into account the obstacles on the ground, night VMC minima, airspace;

(3) the use of lights for assembly, layout and inflation;

(4) the requirement for torch or lights to be carried, (pre-flight inspection, etc.);

(5) the use of the external and instrument lights;

(6) the night take-off procedure;

(7) the checklist procedures at night;

(8) the emergency procedures at night;

(9) the navigation principles at night; and

(10) the map marking for night use (highlighting built up or lit areas with thicker lines, etc.).

(c) Air exercise

The student instructor has to demonstrate:

(1) the use of lights for assembly, layout and inflation;

(2) the flight planning, taking into account the obstacles on the ground, night VMC minima, airspace;

(3) the use of torch or lights for pre-flight inspection;

(4) the use of external and instrument lights;

(5) the night take-off procedure;

(6) how to perform the checklist procedures at night;

(7) how to maintain safety altitude;

(8) the simulated night emergency procedures;

(9) the navigation principles at night;

(10) the night cross-country techniques, as appropriate;

(11) how to advise the student pilot to perform a flight at night; and

(12) how to analyse and correct faults or errors of the student pilot.

(d) Debriefing

BFCL.345 FI(B) – Assessment of competence

(a) Applicants for the issue of an FI(B) certificate shall pass an assessment of competence on a balloon to demonstrate to an examiner qualified in accordance with point BFCL.415(c) the ability to instruct a student pilot to the level required for the issue of a BPL.

(b) The assessment shall include:

(1) the demonstration of the competencies described in point BFCL.325 during pre-flight, post-flight and theoretical knowledge instruction;

(2) oral theoretical examinations on the ground, pre-flight and post-flight briefings, and in-flight demonstrations in the appropriate balloon class;

(3) exercises adequate to evaluate the instructor's competencies.

AMC1 BFCL.345 FI(B) – Assessment of competence

GENERAL

(a) The format and application form for the assessment of competence are determined by the Authority.

(b) The balloon that is used for the assessment should meet the requirements for training aircraft.

(c) The FE(B) acts as the PIC, except in circumstances agreed upon by the FE(B) when another FI(B) is designated as PIC for the flight.

(d) The 'student' is either a real balloon student pilot under training or, in all other cases, the FE(B) or another FI(B). The applicant is required to explain the relevant exercises and to demonstrate their conduct to the 'student', where appropriate. Thereafter, the 'student' executes the same manoeuvres which can include typical mistakes of inexperienced students. The applicant is expected to correct mistakes orally or, if necessary, by intervening physically.

(e) If more than one flight is necessary in order to complete all relevant exercises, these flights should be completed as close together in time as practicable and, in any case, within a period of 6 months. In principle, failure in any exercise requires a retest covering all exercises, with the exception of those that may be retaken separately. The FE(B) may terminate the assessment at any stage if they consider that a retest is required.

(f) The total flight time of the assessment of competence should be at least 45 minutes.

AMC2 BFCL.345 FI(B) – Assessment of competence

CONTENT OF THE ASSESSMENT OF COMPETENCE

(a) The content of the assessment of competence for the FI(B) should be the following:

SECTION 1: ORAL THEORETICAL KNOWLEDGE EXAMINATION	
1.1	Air law
1.2	Aircraft general knowledge
1.3	Flight performance and planning
1.4	Human performance and limitations
1.5	Meteorology
1.6	Navigation
1.7	Operational procedures
1.8	Principles of flight
1.9	Training administration
1.10	Assessment of a BPL student's readiness for first solo flight
1.11	Particularities of pre-flight briefing prior to the first solo flight of a BPL student

SECTION 2: PRE-FLIGHT BRIEFING	
2.1	Visual presentation
2.3	Technical accuracy

2.4	Clarity of explanation
2.5	Clarity of speech
2.6	Instructional technique
2.7	Use of models and aids
2.8	Student participation

SECTION 3: FLIGHT	
3.1	Arrangement of demonstration
3.2	Synchronisation of speech with demonstration
3.3	Correction of faults
3.4	Aircraft handling
3.5	Instructional technique
3.6	General airmanship and safety
3.7	Positioning and use of airspace

SECTION 4: POST-FLIGHT DE-BRIEFING	
4.1	Visual presentation
4.2	Technical accuracy
4.3	Clarity of explanation
4.4	Clarity of speech
4.5	Instructional technique
4.6	Use of models and aids
4.7	Student participation

(b) Section 1, the oral theoretical knowledge examination part of the assessment of competence, is divided into two parts:

(1) The applicant is required to give a lecture under test conditions to other 'student(s)', one of whom will be the FE(B). The test lecture is to be selected from items of Section 1. The amount of time for the preparation of the test lecture is agreed upon beforehand with the FE(B). Appropriate literature may be used by the applicant. The test lecture should not exceed 45 minutes.

(2) The applicant is tested orally by an FE(B) for knowledge of items of Section 1 and the core instructor competencies (teaching and learning content given in the FI(B) training course).

(c) Sections 2, 3 and 4 comprise exercises to demonstrate the ability to be an FI(B) (for example, instructor demonstration exercises) chosen by the FE(B) from the flight syllabus of the FI(B) training course. The applicant is required to demonstrate FI(B) abilities, including briefing, flight instruction and de-briefing.

AMC3 BFCL.345 FI(B) – Assessment of competence

APPLICATION AND REPORT FORM FOR THE FI(B) ASSESSMENT OF COMPETENCE

APPLICATION AND REPORT FORM FOR THE FI(B) ASSESSMENT OF COMPETENCE			
I hereby apply for the issue of a flight instructor certificate for balloons (FI(B)) in accordance with Part-BFCL to MCAR Balloons.			
1	**Applicant's personal particulars:**		
Applicant's last name(s):		First name(s):	
Date of birth:	Telephone:	Email:	
Address:		Country:	
Date:		Signature of the applicant:	
2	**Licence details**		
Licence number (BPL):			
Class extension(s): *(tick as applicable)*	☐ Hot-air balloons/Groups: ☐ A ☐ B ☐ C ☐ D ☐ Gas balloons ☐ Hot-air airships		
Additional privileges: *(tick as applicable)*	☐ Tethered hot-air balloon flight rating ☐ Night rating		
3	**Pre-course flying experience**		
Flying hours in different classes	Hot-air balloon	Gas balloon	Hot-air airship
PIC			
Total time			
4	**Pre-entry assessment**		
I recommend .....for the FI(B) course.			
Name of ATO/DTO:		Date of pre-entry assessment:	
Name (capital letters) of HT of the ATO/DTO:			
Name (capital letters), licence number and signature of the FI(B) conducting the flight assessment (if applicable):			
5	**Declaration by the ATO/DTO**		
I certify that ..... has satisfactorily completed an approved course of training for the FI(B) certificate in accordance with the relevant syllabus.			
Flying hours during the course:		Take-offs during the course:	
Name(s) of HT:			
Signature:			
Name of ATO/DTO:			
FROM HERE TO BE COMPLETED BY THE EXAMINER			
6	**Result of the assessment of competence**		
Oral theoretical knowledge examination:	☐ Passed ☐ Partially passed ☐ Failed	Practical part:	☐ Passed ☐ Partially passed ☐ Failed
Reasons and details in case of fail or partial pass/other remarks as necessary:			

In case of fail: *(tick as applicable)*	☐ *I recommend further ground training before retest.* ☐ *I recommend further flight training with an FI(B) before retest.* ☐ *I do not consider further flight or theoretical instruction necessary before retest.*
I, the undersigning examiner: - have received information from the applicant regarding their experience and instruction, and found that the experience and instruction comply with the applicable requirements of Part-BFCL to MCAR Balloons; - confirm that all the required manoeuvres and exercises have been completed, unless specified otherwise above in the case of fail; and - where applicable, have reviewed and applied the national procedures and requirements of Mauritius which is different from the competent authority that issued my examiner certificate.	
Examiner's certificate number:	Examiner's BPL number:
Examiner's name (capital letters):	Date and examiner's signature:
7 Attachments	
Detailed report as per AMC2 BFCL.345 to be attached	
Copy of the FE(B) certificate (in cases where the competent authority of the applicant is different from the competent authority of the examiner)	

BFCL.360 FI(B) certificate – Recency requirements

(a) An FI(B) certificate holder shall only exercise the privileges of his or her certificate if he or she has completed:

(1) within the last three years before the planned exercise of those privileges:

(i) instructor refresher training at an ATO, a DTO, or the Authority during which the holder shall receive theoretical knowledge instruction for refreshing and updating the knowledge relevant for balloon instructors;

(ii) at least 6 hours of flight instruction in balloons as FI(B); and

(2) within the last nine years and in accordance with the procedures established for that purpose by the Authority, one instruction flight on a balloon as FI(B) under the supervision and to the satisfaction of an FI(B) who is qualified in accordance with point BFCL.315(a)(4) and nominated by the head of training of an ATO or a DTO.

(b) The hours flown as an FE(B) during skill tests, proficiency checks or assessments of competence shall be fully credited towards the requirement in paragraph (a)(1)(ii).

(c) If an FI(B) certificate holder has failed to complete the instruction flight under supervision to the satisfaction of the FI(B) in accordance with paragraph (a)(2), he or she shall not exercise the privileges of the FI(B) certificate until he or she has successfully completed an assessment of competence in accordance with point BFCL.345.

(d) To resume the exercise of the privileges of the FI(B) certificate, an FI(B) certificate holder who does not comply with all the requirements of paragraph (a) shall comply with the requirement of paragraph (a)(1)(i) and of point BFCL.345.

AMC1 BFCL.360(a)(1)(i) FI(B) certificate – Recency requirements

INSTRUCTOR REFRESHER TRAINING

(a) The FI(B) refresher training should be held in the form of a seminar. Such seminars made available in the State should have due regard to geographical location, number of participants, and frequency throughout the territory of the State concerned.

(b) Such seminars should run for at least 1 day (with a minimum of 6 hours of teaching time), and attendance from participants will be required for the whole duration of the seminar including breakout groups and workshops.

(c) Some experienced FI(B)s currently involved with flying training and with a practical understanding of the recency requirements and the current instructional techniques should be included as speakers at these seminars.

(d) The attendance form will be completed and signed by the organiser of the seminar as approved by the Authority, following attendance and satisfactory participation by the FI(B).

(e) The content of the FI(B) refresher seminar should be selected from the following:

(1) new or current rules or regulations, with emphasis on knowledge of MCAR-Part-BFCL and operational requirements;

(2) teaching and learning;

(3) instructional techniques;

(4) the role of the instructor;

(5) national regulations (as applicable);

(6) human factors;

(7) flight safety, incident and accident prevention;

(8) airmanship;

(9) legal aspects and enforcement procedures;

(10) navigational skills including new or current radio navigation aids;

(11) weather-related topics including methods of distribution; and

(12) any additional topic selected by the Authority.

(f) Formal sessions should allow for a presentation time of 45 minutes, with 15 minutes for questions. The use of visual aids is recommended, with interactive video and other teaching aids (where available) for breakout groups and workshops.

GM1 BFCL.360(a)(1)(i) FI(B) certificate – Recency requirements

FREQUENCY OF INSTRUCTOR REFRESHER TRAINING

In order to maintain instructor privileges, point BFCL.360(a)(1)(i) requires FI(B) certificate holders to complete instructor refresher training once in 3 years. However, ATOs or DTOs may decide to provide more frequent internal standardisation/refresher training to their instructors.

AMC1 BFCL.360(a)(2) FI(B) certificate – Recency requirements

INSTRUCTION FLIGHT UNDER SUPERVISION

(a) The aim of the instruction flight under supervision as per point BFCL.360(a)(2) is to confirm continued instructor competency.

(b) The instruction flight under supervision should be arranged to ensure that the FI(B) being supervised demonstrates, on the ground and during at least one flight, knowledge, skills and attitudes relevant to the FI(B) task including at least all of the following:

(1) technical knowledge;

(2) ability to teach a sample of the air exercises from the BPL training course;

(3) a sufficiently high standard of flying;

(4) application of instructing principles; and

(5) application of TEM.

(c) The supervising instructor should enter the successful completion of the flight under supervision into the logbook of the applicant.

SUBPART FE — FLIGHT EXAMINERS

SECTION 1 – GENERAL REQUIREMENTS

BFCL.400 Balloon flight examiner certificates

(a) General

An examiner shall only carry out skill tests, proficiency checks or assessments of competence in accordance with this MCAR if he or she:

(1) holds:

(i) a BPL including privileges, ratings and certificates for which he or she is authorised to conduct skill tests, proficiency checks or assessments of competence, and the privileges to instruct for them;

(ii) an FE(B) certificate including privileges appropriate to the skill test, proficiency check or assessment of competence conducted, issued in accordance with this Subpart;

(2) is entitled to act as PIC in a balloon during the skill test, proficiency check or assessment of competence.

(b) Examinations conducted outside Mauritius

(1) By way of derogation from paragraph (a)(1), in the case of skill tests and proficiency checks performed outside Mauritius, the Authority shall issue an examiner certificate to an applicant who holds a balloon pilot licence that is compliant with Annex 1 to the Chicago Convention, provided that the applicant:

(i) holds at least a licence including, where relevant, privileges, ratings, or certificates equivalent to those for which he or she is authorised to conduct skill tests or proficiency checks;

(ii) complies with the requirements established in this Subpart for the issue of the relevant examiner certificate;

(iii) demonstrates to the Authority an adequate level of knowledge of aviation safety rules to be able to exercise examiner privileges in accordance with this MCAR.

(2) The certificate referred to in subparagraph (1) shall be limited to performing skill tests and proficiency checks:

(i) in Mauritius; and

(ii) to a pilot who has sufficient knowledge of the language in which the test/check is provided.

BFCL.405 Limitation of privileges in case of vested interests

A balloon examiner shall not conduct:

(a) a skill test or assessment of competence of an applicant for the issue of a licence, rating or certificate to whom he or she has provided more than 50 % of the required flight instruction for the licence, rating or certificate for which the skill test or assessment of competence is taken; or

(b) a skill test, proficiency check or assessment of competence whenever he or she feels that his or her objectivity may be affected.

GM1 BFCL.405 Limitation of privileges in case of vested interests

Examples of a situation where examiners should consider if their objectivity is affected are when the applicant is a relative or a friend of the examiner, or when they are linked by economic interests or political affiliations, etc. It is acknowledged that in small sport/industry like ballooning, it is likely that examiners and candidates will be known to each other in many cases.

GM1 BFCL.405(a) Limitation of privileges in case of vested interests

EXAMINERS WHO PROVIDED INSTRUCTION TO THE CANDIDATE

Point BFCL.405(a) allows an examiner to have been involved, as a flight instructor, into 50 % of the candidate's flight instruction. It is recommended that in such cases that 50 % should be spread throughout the course, and not performed towards the end of the course. ATOs and DTOs should plan and arrange assignments between instructors and students appropriately.

BFCL.410 Conduct of skill tests, proficiency checks and assessments of competence

(a) When conducting skill tests, proficiency checks and assessments of competence, a balloon examiner shall do all of the following:

(1) ensure that communication with the applicant can be established without language barriers;

(2) verify that the applicant complies with all the qualification, training and experience requirements of this MCAR for the issue, revalidation or renewal of the licence, privileges, rating or certificate for which the skill test, proficiency check or assessment of competence is taken; and

(3) make the applicant aware of the consequences of providing incomplete, inaccurate or false information related to his or her training and flight experience.

(b) After completion of the skill test, proficiency check or assessment of competence, the balloon examiner shall:

(1) inform the applicant of the results of the skill test, proficiency check or assessment of competence;

(2) in the event of a pass in an assessment of competence for the revalidation or renewal, endorse the new expiry date on the applicant's licence or certificate, if specifically authorised for that purpose by the Authority that is responsible for the applicant's licence;

(3) provide the applicant with a signed report of the skill test, proficiency check or assessment of competence and submit without undue delay copies of the report to the Authority that is responsible for the applicant's licence, and to the competent authority that issued the examiner certificate. The report shall include:

(i) a declaration that the balloon examiner has received information from the applicant regarding his or her experience and instruction, and found that experience and instruction comply with the applicable requirements of this MCAR;

(ii) confirmation that all the required manoeuvres and exercises have been completed, as well as information on the verbal theoretical knowledge examination, when applicable. If an item has been failed, the examiner shall record the reasons for this assessment;

(iii) the results of the skill test, proficiency check or assessment of competence;

(iv) a declaration that the balloon examiner has reviewed and applied the national procedures and requirements of the applicant's Authority if the Authority that is responsible for the applicant's licence is not the one that issued the examiner's certificate;

(v) a copy of the balloon examiner certificate containing the scope of his or her privileges as balloon examiner in the case of skill tests, proficiency checks or assessments of competence of an applicant whose Authority is not the one that issued the examiner's certificate.

(c) The balloon examiner shall maintain the records for five years with details of all skill tests, proficiency checks and assessments of competence performed and their results.

(d) Upon request by the Authority that is responsible for the balloon examiner certificate, or the Authority that is responsible for the applicant's licence, the

balloon examiner shall submit all records and reports, and any other information, as required, for oversight activities.

AMC1 BFCL.410(b)(3) Conduct of skill tests, proficiency checks and assessments of competence

APPLICATION AND REPORT FORM FOR THE BPL SKILL TEST OR PROFICIENCY CHECK

<table>
<tr><td colspan="4">APPLICATION AND REPORT FORM FOR THE BPL SKILL TEST OR PROFICIENCY CHECK</td></tr>
<tr><td rowspan="2">Tick as applicable</td><td colspan="3">I hereby apply for the issue of the following, in accordance with MCAR Balloons:
☐ Balloon pilot licence (BPL)
☐ Commercial operation rating</td></tr>
<tr><td colspan="3">I hereby report the following, in accordance with Part-BFCL to MCAR Balloons:
☐ Proficiency check (BPL — recency)
☐ Proficiency check (commercial operation rating)</td></tr>
<tr><td colspan="4">1 Applicant’s personal particulars:</td></tr>
<tr><td colspan="2">Applicant’s last name(s):</td><td colspan="2">First name(s):</td></tr>
<tr><td>Date of birth:</td><td>Telephone:</td><td colspan="2">Email:</td></tr>
<tr><td colspan="2">Address:</td><td colspan="2">Country:</td></tr>
<tr><td colspan="2">Date:</td><td colspan="2">Signature:</td></tr>
<tr><td colspan="4">2 Licence details</td></tr>
<tr><td colspan="4">Licence number (if applicable):</td></tr>
<tr><td>Class extension(s):
(tick as applicable)</td><td colspan="3">☐ Hot-air balloons/Groups: ☐ A ☐ B ☐ C ☐ D
☐ Gas balloons
☐ Hot-air airships</td></tr>
<tr><td colspan="4">FROM HERE TO BE COMPLETED BY THE EXAMINER</td></tr>
<tr><td colspan="4">3 Details of the skill test/proficiency check flight</td></tr>
<tr><td>Date:</td><td>Class/group of balloon:</td><td colspan="2">Registration:</td></tr>
<tr><td>Take-off site:</td><td>Take-off time:</td><td>Landing time:</td><td>Flight time:</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="3">Total flight time:</td><td></td></tr>
<tr><td colspan="4">4 Result of the test or check</td></tr>
<tr><td colspan="4">Skill test/proficiency check details (including information on oral theoretical knowledge examination, where applicable):</td></tr>
<tr><td>Passed ☐</td><td>Partially passed ☐</td><td colspan="2">Failed ☐</td></tr>
<tr><td colspan="4">5 Remarks</td></tr>
<tr><td colspan="4">Reasons and details in case of fail or partial pass/other remarks as necessary:</td></tr>
<tr><td colspan="4">6 Examiner’s declarations and details</td></tr>
</table>

I, the undersigning examiner: - have received information from the applicant regarding their experience and instruction, and found that the experience and instruction comply with the applicable requirements of Part-BFCL to MCAR Balloons; - confirm that all the required manoeuvres and exercises have been completed, unless specified otherwise above in the case of fail or partial pass; and - where applicable, have reviewed and applied the national procedures and requirements of Mauritius which is different from the competent authority that issued my examiner certificate.	
Examiner's certificate number:	Examiner's BPL number:
Examiner's name (capital letters):	Date and examiner's signature:
7 Attachments	
Detailed report of skill test or proficiency check as per AMC1 BFCL.145 or AMC1 BFCL.215 (as applicable) to be attached	
Copy of the FE(B) certificate (in cases where the competent authority of the applicant is different from the competent authority of the examiner)	

SECTION 2 – FLIGHT EXAMINER CERTIFICATE FOR BALLOONS – FE(B)

BFCL.415 FE(B) certificate – Privileges and conditions

Subject to compliance of the applicant with point BFCL.420 and with the following conditions, an FE(B) certificate shall be issued upon application with privileges to conduct:

(a) skill tests and proficiency checks for the BPL and skill tests for the extension of the privileges to another balloon class, provided that the applicant has completed 250 hours of flight time as pilot on balloons, including 50 hours of flight instruction covering the full syllabus of a BPL training course;

(b) skill tests and proficiency checks for the commercial operation rating as specified in point BFCL.215, provided that the applicant complies with the experience requirements set out in paragraph (a) and has received specific training during an examiner standardisation course in accordance with point BFCL.430;

(c) assessments of competence for the issue of an FI(B) certificate, provided that the applicant has:

(1) completed 350 hours of flight time as pilot on balloons, including 5 hours of instruction to an applicant for the FI(B) certificate;

(2) received specific training during an examiner standardisation course in accordance with point BFCL.430.

AMC1 BFCL.415(b) FE(B) certificate – Privileges and conditions

SPECIFIC TRAINING FOR EXAMINER PRIVILEGES RELATED TO THE COMMERCIAL OPERATION RATING

The specific training for examiner privileges related to the commercial operation rating should:

(a) be completed under the supervision of an FE(B) who holds the privileges in accordance with point BFCL.415(b); and

(b) include at least all of the following:

(1) the requirements of MCAR-Part-BFCL for the commercial operation rating;

(2) theoretical knowledge necessary for the conduct of skill tests and proficiency checks for the commercial operation rating in accordance with AMC1 BFCL.215(b)(4); and

(3) the conduct of one skill test or proficiency check for the commercial operation rating which, if conducted during an initial examiner standardisation course in accordance with point BFCL.430, should be completed in addition to the skill test or proficiency check for the BPL, as required by point BFCL.430(b)(1).

AMC1 BFCL.415(c)(2) FE(B) certificate – Privileges and conditions

SPECIFIC TRAINING FOR EXAMINER PRIVILEGES RELATED TO THE FI(B) CERTIFICATE

Specific training for examiner privileges related to the FI(B) certificate should:

(a) be completed under the supervision of an FE(B) who holds the privileges in accordance with point BFCL.415(c); and

(b) include at least all of the following:

(1) the requirements of MCAR-Part-BFCL for the FI(B) certificate;

(2) the content of AMC1 BFCL.345, AMC2 BFCL.345 and AMC3 BFCL.345; and

(3) the conduct of one assessment of competence for the FI(B) certificate which, if conducted during an initial examiner standardisation course in accordance with point BFCL.430, should be completed in addition to the skill test or proficiency check for the BPL, as required by point BFCL.430(b)(1).

BFCL.420 FE(B) certificate – Prerequisites and requirements

Applicants for an FE(B) certificate shall:

(a) comply with the requirements of subparagraphs (a)(1)(i) and (2) of point BFCL.400;

(b) have completed the FE(B) standardisation course in accordance with point BFCL.430;

(c) have completed an assessment of competence in accordance with point BFCL.445;

(d) demonstrate relevant background related to the privileges of the FE(B) certificate; and

(e) demonstrate that he or she has not been subject to any sanctions, including the suspension, limitation or revocation of any of his or her licences, ratings or certificates issued in accordance with this MCAR, with MCAR-Part-FCL, or with MCAR-Part-SFCL, for non-compliance with the Civil Aviation Regulations and its associated MCAR's during the last three years.

AMC1 BFCL.420(d) FE(B) certificate – Prerequisites and requirements

EVALUATION OF THE RELEVANT BACKGROUND OF AN APPLICANT

When evaluating the applicant's background, the Authority should evaluate the personality and character of the applicant, and their cooperation with the Authority.

The Authority may also take into account whether the applicant has been convicted of any relevant criminal or other offences, taking into account national law and principles of non-discrimination.

BFCL.430 FE(B) certificate – Standardisation course

(a) Applicants for an FE(B) certificate shall take a standardisation course which is provided either by the Authority or by an ATO or a DTO and approved by the Authority.

(b) The standardisation course shall be tailored to the balloon flight examiner privileges sought and shall consist of theoretical and practical instruction, including, at least:

(1) the conduct of at least one skill test, proficiency check or assessment of competence for the BPL or associated ratings or certificates;

(2) instruction on the applicable requirements of this MCAR and the applicable air operations requirements, the conduct of skill tests, proficiency checks and assessments of competence, and their documentation and reporting;

(3) a briefing on the following:

(i) national administrative procedures;

(ii) requirements for the protection of personal data;

(iii) examiner's liability;

(iv) examiner's accident insurance;

(v) national fees; and

(vi) information on how to access the information contained in points (i) to (v) when conducting skill tests, proficiency checks or assessments of competence of an applicant whose Authority is not the one that issued the examiner certificate.

(c) An FE(B) certificate holder shall not conduct skill tests, proficiency checks or assessments of competence of an applicant whose competent authority is not the one that issued the examiner certificate, unless he or she has reviewed the

latest available information containing the relevant national procedures of the Authority.

AMC1 BFCL.430 FE(B) certificate – Standardisation course

(a) GENERAL

(1) When issuing an approval for the conduct of FE(B) standardisation courses to an ATO or a DTO, the Authority should monitor the execution of these courses through appropriate oversight measures.

(2) An FE(B) standardisation course should last at least 1 day, divided into theoretical and practical training.

(3) The Authority, the ATO or the DTO should determine any further training required before presenting the candidate for the examiner assessment of competence.

(b) CONTENT

(1) Theoretical training

(i) The theoretical training should cover at least:

(A) the contents of AMC2 BFCL.430 and the flight examiner manual (FEM);

(B) MCAR-Part-BFCL and the related AMC and GM that are relevant to their duties;

(C) operational requirements and the related AMC and GM that are relevant to their duties;

(D) national requirements that are relevant to their examination duties;

(E) fundamentals of human performance and limitations that are relevant to flight examination;

(F) fundamentals of evaluation that are relevant to an applicant's performance; and

(G) the management system of ATOs and the organisational structure of DTOs.

(ii) Examiners should also be briefed on the protection requirements for personal data, liability, accident insurance and fees, as applicable in the State concerned.

(iii) All the items above are the core knowledge requirements for an examiner and are recommended as the core course material.

This core course material may be studied before the recommended examiner training is commenced. The core course may utilise any suitable training format.

(2) Practical training

(i) Practical training should include at least:

(A) knowledge and management of the test for which the certificate is to be sought. These are described in the relevant modules in the FEM; and

(B) knowledge of the administrative procedures pertaining to that test or check.

(ii) For an initial examiner certificate, practical training should include the examination of the test profile sought, consisting of the conduct of at least one test or check profiles in the role of an examiner, including briefing, conduct of the skill test and proficiency check, assessment of the applicant to whom the test or check is given, debriefing and recording or documentation under the supervision of an examiner.

AMC2 BFCL.430 FE(B) certificate – Standardisation course

STANDARDISATION ARRANGEMENTS FOR EXAMINERS

(a) General

(1) An examiner should allow an applicant adequate time to prepare for a test or check.

(2) An examiner should plan a test or check flight so that all required exercises can be performed while allowing sufficient time for each of the exercises and with due regard to the weather conditions, traffic situation, ATC requirements and local procedures.

(b) Purpose of a test or check

(1) Determination through practical demonstration during a test or check that an applicant has acquired or maintained the required level of knowledge and skill or proficiency.

(2) Improvement of training and flight instruction in ATOs or DTOs through feedback from examiners about items or sections of tests or checks that are most frequently failed.

(3) Assistance in maintaining and, where possible, improving air safety standards by having examiners display good airmanship and flight discipline during tests or checks.

(c) Conduct of a test or check

(1) An examiner will ensure that an applicant completes a test or check in accordance with the MCAR-Part-BFCL requirements and is assessed against the required test or check standards.

(2) Each item within a test or check section should be completed and assessed separately. The test or check schedule, as briefed, should normally not be altered by an examiner.

(3) A marginal or questionable performance of a test or check item should not influence an examiner's assessment of any subsequent items.

(4) An examiner should verify the requirements and limitations of a test or check with an applicant during the pre-flight briefing.

(5) When a test or check is completed or discontinued, an examiner should debrief the applicant and give reasons for items or sections failed. In case of a failed or discontinued skill test and proficiency check, the examiner should provide appropriate advice to assist the applicant in retests or rechecks.

(6) Any comment on, or disagreement with, an examiner's test or check evaluation or assessment made during a debriefing will be recorded by the examiner on the test or check report, and will be signed by the examiner and countersigned by the applicant.

(d) Examiner preparation

(1) An examiner should supervise all aspects of the test or check flight preparation, including, where necessary, obtaining or assuring an ATC clearance/liaison.

(2) An examiner will plan a test or check in accordance with the MCAR-Part-BFCL requirements. Only the manoeuvres and procedures set out in the appropriate test or check form will be undertaken. The same examiner should not re-examine a failed applicant without the agreement of the applicant.

(e) Examiner approach

An examiner should encourage a friendly and relaxed atmosphere both before and during a test or check flight. A negative or hostile approach should not be used. During the test or check flight, the examiner should avoid negative comments or criticisms, and all assessments should be reserved for the debriefing.

(f) Assessment system

Although test or checks may specify flight test tolerances, an applicant should not be expected to achieve these at the expense of smoothness or stable flight.

An examiner should make due allowance for unavoidable deviations due to turbulence, ATC instructions, etc. An examiner should terminate a test or check only either when it is clear that the applicant has not been able to demonstrate the required level of knowledge, skill or proficiency and that a full retest will be necessary or for safety reasons. An examiner will use one of the following terms for assessment:

(1) a 'pass' provided that the applicant demonstrates the required level of knowledge, skill or proficiency and, where applicable, remains within the flight test tolerances for the licence or rating;

(2) a 'fail' provided that any of the following apply:

(i) the flight test tolerances have been exceeded after the examiner has made due allowance for turbulence or ATC instructions;

(ii) the aim of the test or check is not met;

(iii) the aim of the exercise is met but at the expense of safe flight, violation of a rule or regulation, poor airmanship or poor control;

(iv) an acceptable level of knowledge is not demonstrated;

(v) an acceptable level of flight management is not demonstrated; and

(vi) the intervention of the examiner or safety pilot is required in the interest of safety; and

(3) a 'partial pass' in accordance with the criteria shown in the relevant skill test appendix to MCAR-Part-BFCL.

(g) Method and contents of the test or check

(1) Before undertaking a test or check, an examiner will verify that the balloon intended to be used is suitable and appropriately equipped for the test or check. Aircraft that fall under the Civil Aviation Regulations can be used, provided that they are subject to an authorisation as per point ORA.ATO.135 of MCAR-Part-ORA or point DTO.GEN.240 of MCAR-Part-DTO.

(2) A test or check flight will be conducted in accordance with the AFM.

(3) A test or check flight will be conducted within the limitations contained in the operations manual of an ATO or the balloon operator for which the applicant is flying, as applicable, or, if available, within the limitations placed by the DTO.

(4) Contents

A test or check is comprised of:

(i) oral examination on the ground (where applicable) which should include:

(A) balloon general knowledge and performance;

(B) planning and operational procedures;

(C) theoretical knowledge in the common subjects as per point BFCL.135(a)(1) in cases where the applicant receives a credit in accordance with point BFCL.140(a), based on a licence the privileges of which were not exercised for more than 2 years; and

(D) other relevant items or sections of the test or check;

(ii) pre-flight briefing which should include:

(A) test or check sequence; and

(B) safety considerations.

(iii) in-flight exercises which should include each relevant item or section of the test or check; and

(iv) post-flight debriefing which should include:

(A) assessment or evaluation of the applicant; and

(B) documentation of the test or check with the applicant's FI(B) present, if possible.

(5) A test or check is intended to simulate a practical flight. Thus, an examiner may set practical scenarios for an applicant while ensuring that the applicant is not confused and air safety is not compromised.

(6) An examiner should maintain a flight log and assessment record during the test or check for reference during the post-flight debriefing.

(7) An examiner should be flexible with regard to the possibility of changes arising to pre-flight briefings due to ATC instructions, or other circumstances affecting the test or check.

(8) Where changes arise to a planned test or check, an examiner should be satisfied that the applicant understands and accepts the changes. Otherwise, the test or check flight should be terminated.

(9) Should an applicant choose not to continue a test or check for reasons considered inadequate by an examiner, the applicant will be assessed as having failed those items or sections not attempted. If the test or check is terminated for reasons considered adequate by the examiner, only these items or sections not completed will be tested during a subsequent test or check.

(10) An examiner may terminate a test or check at any stage if it is considered that the applicant's competency requires a complete retest or recheck.

GM1 BFCL.430 FE(B) certificate – Standardisation course

PLANNING OF TESTS AND CHECKS

(a) An FE(B) should plan not more than a total of two skill tests, proficiency checks or assessments of competence per day.

(b) An FE(B) should plan at least 2 hours for a skill test, proficiency check or assessment of competence, including pre-flight briefing and preparation, conduct of the test, check or assessment of competence, de-briefing, evaluation of the applicant and documentation.

BFCL.445 FE(B) certificate – Assessment of competence

An applicant for the initial issue of an FE(B) certificate shall demonstrate his or her competences as an FE(B) to an inspector from the Authority or to a senior examiner specifically authorised to do so by the Authority that is responsible for the FE(B) certificate. During the assessment of competence, the applicant shall conduct a skill test, proficiency check or assessment of competence, including briefing, conduct of the skill test, proficiency check or assessment of competence, and assessment of the person to whom the test, check or assessment is given, debriefing and recording documentation.

AMC1 BFCL.445 FE(B) certificate – Assessment of competence

(a) GENERAL

The Authority may nominate either one of its inspectors or a senior examiner to assess the competence of applicants for the FE(B) certificate.

(b) DEFINITIONS

(1) 'Inspector/senior examiner': the inspector of the Authority or the senior examiner who is conducting the examiner competence assessment.

(2) 'Examiner applicant': the person seeking certification as an examiner.

(3) 'Candidate': the person being tested or checked by the examiner applicant. This person may be a pilot for whom the test or check would be required, or the inspector of the Authority or the senior examiner who is conducting the examiner certification acceptance test.

(c) CONDUCT OF THE ASSESSMENT

An inspector/senior examiner will observe all examiner applicants conducting a test on a 'candidate' in a balloon for which examiner certificate is sought. Items

from the related training course and test or check schedule will be selected by the inspector/senior examiner for examination of the 'candidate' by the examiner applicant. Having agreed with the inspector/senior examiner the content of the test, the examiner applicant will be expected to manage the entire test. This will include briefing, the conduct of the flight, assessment and debriefing of the 'candidate'. The inspector/senior examiner will discuss the assessment with the examiner applicant before the 'candidate' is debriefed and informed of the result.

(d) BRIEFING THE 'CANDIDATE'

(1) The 'candidate' should be given time and facilities to prepare for the test flight. The briefing should cover the following:

(i) the objective of the flight;

(ii) licensing checks, as necessary;

(iii) freedom for the 'candidate' to ask questions;

(iv) operating procedures to be followed (for example, the operator's manual);

(v) weather assessment;

(vi) operating capacity of 'candidate' and examiner;

(vii) aims to be identified by 'candidate';

(viii) simulated weather assumptions (for example, wind speed and visibility cloud base);

(ix) contents of the exercise to be performed;

(x) use of R/T;

(xi) respective roles of 'candidate' and examiner (for example, during emergency); and

(xii) administrative procedures (for example, submission of flight plan).

(2) The examiner applicant should maintain the necessary level of communication with the 'candidate'. The following check details should be followed by the examiner applicant:

(i) the need to give the 'candidate' precise instructions;

(ii) responsibility for the safe conduct of the flight;

(iii) intervention by the examiner, when necessary;

(iv) liaison with ATC (where required) and the need for concise, easily understood intentions;

(v) prompting the 'candidate' about required sequence of events (for example, following an aborted landing); and

(vi) keeping brief, factual and unobtrusive notes.

(e) ASSESSMENT

The examiner applicant should refer to the flight test tolerances given in the relevant skill test. Attention should be paid to the following points:

(1) questions from the 'candidate';

(2) giving the results of the test and any sections failed; and

(3) giving the reasons for failure.

(f) DEBRIEFING

The examiner applicant should demonstrate to the inspector the ability to conduct a fair, unbiased debriefing of the 'candidate' based on identifiable factual items. A balance between friendliness and firmness should be evident. The following points should be discussed with the 'candidate', at the applicant's discretion:

(1) advising the candidate on how to avoid or correct mistakes;

(2) mentioning any other points of criticism noted; and

(3) giving any advice considered helpful.

(g) RECORDING OR DOCUMENTATION

The examiner applicant should demonstrate to the inspector the ability to complete the relevant records correctly. These records may be:

(1) the relevant test or check form;

(2) the licence entry;

(3) the notification of failure form; and

(4) relevant company forms where the examiner has privileges of conducting operator proficiency checks.

(h) DEMONSTRATION OF THEORETICAL KNOWLEDGE

The examiner applicant should demonstrate to the inspector a satisfactory knowledge of the regulatory requirements associated with the function of an examiner.

AMC1 BFCL.445; BFCL.460 FE(B) certificate – Assessment of competence; FE(B) certificate – Validity, revalidation and renewal

QUALIFICATION OF SENIOR EXAMINERS

(a) A senior examiner specifically tasked by the Authority to observe skill tests or proficiency checks for the revalidation of examiner certificates should:

(1) hold a valid or current examiner certificate appropriate to the privileges being granted;

(2) have examiner experience of a level acceptable to the Authority; and

(3) have conducted a number of skill tests or proficiency checks as an FE(B).

(b) The Authority may conduct a pre-assessment of the applicant or candidate carrying out a skill test and proficiency check under the supervision of an inspector of the Authority.

(c) Applicants should be required to attend a senior examiner briefing, course or seminar arranged by the Authority. The content and duration will be determined by the Authority and should include:

(1) pre-course self-study;

(2) legislation;

(3) the role of the senior examiner;

(4) an examiner assessment; and

(5) national administrative requirements.

(d) The validity of the authorisation should not exceed the validity of the examiner's certificate, and in any case should not exceed 5 years. The authorisation may be revalidated in accordance with procedures established by the Authority.

BFCL.460 FE(B) certificate – Validity, revalidation and renewal

(a) An FE(B) certificate shall be valid for five years.

(b) An FE(B) certificate shall be revalidated if its holder has:

(1) during the validity period of the FE(B) certificate, completed an examiner refresher course which is provided either by the Authority or by an ATO or a DTO and approved by the Authority, during which the holder shall receive theoretical knowledge instruction for refreshing and updating the knowledge relevant for balloon examiners; and

(2) within the last 24 months preceding the end of the validity period of the certificate, conducted one skill test, proficiency check or assessment of competence under the supervision and to the satisfaction of an inspector from the Authority or an examiner specifically authorised to do so by the Authority that is responsible for the FE(B) certificate.

(c) An FE(B) certificate holder who also holds one or more examiner certificates for other aircraft categories in accordance with MCAR-Part-FCL or with MCAR-Part-SFCL may achieve combined revalidation of all examiner certificates held, in agreement with the Authority.

(d) If an FE(B) certificate has expired, its holder shall comply with the requirements of paragraph (b)(1) and of point BFCL.445 before he or she can resume the exercise of the privileges of the FE(B) certificate.

(e) An FE(B) certificate shall only be revalidated or renewed if the applicant demonstrates continued compliance with the requirements of point BFCL.410 as well as with the requirements of point BFCL.420(d) and (e).'

AMC1 BFCL.460(b)(1) FE(B) certificate – Validity, revalidation and renewal

EXAMINER REFRESHER COURSE

An FE(B) refresher course should be organised as a seminar that follows the content of the examiner standardisation course set out in AMC1 BFCL.430.

CHAPTER 2 — CONTINUING AIRWORTHINESS

For organisation and related Authority requirements relevant to the application of Part-ML, please refer to MCAR-Part-145, MCAR-Part-CAMO, or MCAR-Part-CAO, as applicable.

PART-ML

GENERAL

ML.1

(a) In accordance regulations 19(2)(a), 19(4), 19(6)(c), 44(6)(b), 44(8)(a), 101(2)(a), 101(2)(b) and eighth schedule scale B of the Civil Aviation Regulations, this Part-ML applies to the following other than complex motor-powered aircraft not listed in the air operator certificate of an air carrier licensed in accordance with the Civil Aviation Regulations:

(1) aeroplanes of 2 730 kg maximum take-off mass (MTOM) or less;

(2) rotorcraft of 1 200 kg MTOM or less, certified for a maximum of up to 4 occupants;

(3) other ELA2 aircraft.

(b) For the purpose of this Part-ML, the competent authority shall be the Authority.

(c) For the purpose of this Part-ML, the following definitions shall apply:

(1) 'independent certifying staff' means certifying staff who does not work on behalf of an approved maintenance organisation and who complies with, alternatively:

(i) the requirements of MCAR-Part-66;

(ii) for aircraft to which MCAR-Part-66 does not apply, the certifying staff requirements in force in Mauritius;

(2) 'maintenance organisation' means an organisation holding an approval issued in accordance with, alternatively:

(i) Subpart F of MCAR-Part-M;

(ii) Section A of MCAR-Part-145;

(iii) Section A of MCAR-Part-CAO.

(3) 'owner' means the person responsible for the continuing airworthiness of the aircraft, including, alternatively:

(i) the registered owner of the aircraft;

(ii) the lessee in the case of a leasing contract;

(iii) the operator.

SECTION A — TECHNICAL REQUIREMENTS

SUBPART A — GENERAL

ML.A.101 Scope

This Section establishes the measures to be taken in order to ensure that the aircraft is airworthy. It also specifies the conditions to be met by the persons or organisations involved in the activities related to the airworthiness of the aircraft.

SUBPART B — ACCOUNTABILITY

ML.A.201 Responsibilities

(a) The owner of the aircraft shall be responsible for the continuing airworthiness of the aircraft and shall ensure that no flight takes place unless all of the following requirements are met:

(1) the aircraft is maintained in an airworthy condition;

(2) any operational and emergency equipment fitted is correctly installed and serviceable or clearly identified as unserviceable;

(3) the airworthiness certificate is valid;

(4) the maintenance of the aircraft is performed in accordance with the Aircraft Maintenance Program ('AMP') specified in point ML.A.302.

(b) By derogation from point (a), where the aircraft is leased, the responsibilities set out in point (a) shall apply to the lessee, if the lessee is identified either in the registration document of the aircraft or in the leasing contract.

(c) Any person or organisation performing maintenance of aircraft and components shall be responsible for the maintenance tasks being performed.

(d) The pilot-in-command of the aircraft shall be responsible for the satisfactory accomplishment of the preflight inspection. That inspection shall be carried out by the pilot or another qualified person but need not be carried out by an approved maintenance organisation or by certifying staff.

(e) For aircraft operated by commercial Approved Training Organisations ('ATO') and commercial Declared Training Organisations ('DTO') referred to MCAR-Part-DTO or not operated in accordance with MCAR-Part-NCO or operated in accordance with Subpart-ADD of Part-BOP to this MCAR or Subpart-DEC of Part-SAO of MCAR-Sailplanes, the operator shall:

(1) be approved as a CAMO or as a CAO for the management of the continuing airworthiness of its aircraft in accordance with MCAR-Part-CAMO, Subpart G of MCAR-Part-M or MCAR-Part-CAO, or contract such an organisation using the contract set out in Appendix I to this Part;

(2) ensure that all maintenance is performed by maintenance organisations approved in accordance with point (c)(2) of point ML.1.;

(3) ensure that the requirements of point (a) are satisfied.

(f) For aircraft not included in point (e), in order to satisfy the requirements of point (a), the owner of the aircraft may contract the tasks associated with continuing airworthiness management to an organisation approved as a CAMO or CAO in accordance with MCAR-Part-CAMO, Subpart G of MCAR-Part-M or MCAR-

Part-CAO. In that case, the contracted organisation shall assume responsibility for the proper performance of those tasks and a written contract shall be concluded in accordance with Appendix I to this Part. If the owner does not contract such an organisation, the owner is responsible for the proper performance of the tasks associated with the continuing airworthiness management

(g) The owner shall grant the Authority access to the aircraft and the aircraft records, in order for the Authority to determine whether the aircraft complies with the requirements of this Part-ML.

(h) In the case of an aircraft included in an air operator certificate is used for non-commercial or specialised operations under point ORO.GEN.310 of MCAR-Part-ORO or point NCO.GEN.104 of MCAR-Part-NCO, the operator shall ensure that the tasks associated with continuing airworthiness are performed by the CAMO approved in accordance with MCAR-Part-CAMO or Subpart G of MCAR-Part-M or the combined airworthiness organisation ("CAO") approved in accordance with MCAR-Part-CAO, whichever applicable, of the air operator certificate holder.

GM1 ML.A.201 Responsibilities

The following tables provide a summary of Part-ML main provisions and alleviations established in ML.A.201, ML.A.302, ML.A.801 and ML.A.901.

In the tables, the term 'CAO(-CAM)' designate a CAO with continuing airworthiness management privileges.

<table>
<tr><th rowspan="3"></th><th colspan="3">Balloon</th></tr>
<tr><th rowspan="2">Part-BOP Subpart ADD</th><th colspan="2">Part-BOP non-Subpart ADD</th></tr>
<tr><th>commercial ATO/DTO</th><th>Non-ATO/DTO or non-commercial ATO/DTO</th></tr>
<tr><td>Contract with CAMO/CAO (CAM) required?</td><td>yes</td><td>yes</td><td>no*</td></tr>
<tr><td rowspan="3">Aircraft maintenance programme (AMP)</td><td colspan="2" rowspan="2">The AMP document must be approved by the contracted CAMO/CAO(-CAM)</td><td>If there is no CAMO/CAO(-CAM), the AMP must be declared by the owner.</td></tr>
<tr><td>If there is a contracted CAMO/CAO (-CAM), the AMP must be approved by the CAMO/CAO(-CAM).</td></tr>
<tr><td colspan="3">If ML.A.302(e) conditions are met, producing an AMP document is not required.</td></tr>
<tr><td>Maintenance</td><td colspan="2">By a maintenance organisation</td><td>By a maintenance organisation or by independent certifying staff or the pilot-owner**</td></tr>
<tr><td>Airworthiness review (AR) and airworthiness review certificate (ARC)</td><td colspan="2">By a maintenance organisation*** or by the contracted CAMO/CAO(-CAM) or by the Authority</td><td>By a maintenance organisation*** or independent certifying staff*** or by the CAMO/CAO(-CAM) (if contracted) or by the Authority</td></tr>
</table>

	Sailplane		
	Part-SAO Subpart-DEC	Part-SAO non-Subpart-DEC	
		commercial ATO/DTO	Non-ATO/DTO or non-commercial ATO/DTO
Contract with CAMO/CAO (-CAM) required?	yes	yes	no*
AMP	The AMP document must be approved by the contracted CAMO/CAO(-CAM).		If there is no CAMO/CAO(-CAM), the AMP must be declared by the owner.
			If there is a contracted CAMO/CAO(-CAM), the AMP must be approved by the CAMO/CAO(-CAM).
	If ML.A.302(e) conditions are met, producing an AMP document is not required.		
Maintenance	By a maintenance organisation		By a maintenance organisation or by independent certifying staff or pilot-owner**
AR and ARC	By a maintenance organisation*** or by the contracted CAMO/CAO(-CAM) or by the Authority		By a maintenance organisation*** or independent certifying staff*** or by the CAMO/CAO(-CAM) (if contracted) or by the Authority

	Aircraft (other than balloons and sailplanes)		
	non Part-NCO	Part-NCO	
		commercial ATO/DTO	Non-ATO/DTO or non-commercial ATO/DTO
Contract with CAMO/CAO (-CAM) required?	yes	yes	no*
AMP	The AMP document must be approved by the contracted CAMO/CAO(-CAM).		If there is no CAMO/CAO(-CAM), the AMP must be declared by the owner.
			If there is a contracted CAMO/CAO(-CAM), the AMP must be approved by the CAMO/CAO(-CAM).
	If ML.A.302(e) conditions are met, producing an AMP document is not required.		
Maintenance	By a maintenance organisation		By a maintenance organisation or by independent certifying staff or the pilot-owner**
AR and ARC	By a maintenance organisation*** or by the contracted CAMO/CAO(-CAM) or by the Authority		By a maintenance organisation*** or independent certifying staff*** or by the CAMO/CAO(-CAM) (if contracted) or by the Authority

*: A CAMO/CAO(-CAM) is not required but the owner may decide to contract a CAMO/CAO(-CAM).

**: in the limit of their privileges

***: together with the 100-h/annual inspection

GM1 ML.A.201(e) Responsibilities

COMMERCIAL ATO/DTO

According to industry practice, the following are examples of aircraft not considered to be operated by a commercial ATO or a commercial DTO:

(a) Aircraft operated by an organisation holding an ATO certificate or a DTO declaration, created with the aim of promoting aerial sport or leisure aviation, on the conditions that:

(1) the aircraft is operated by the organisation on the basis of ownership or dry lease;

(2) the ATO/DTO is a non-profit organisation; and

(3) whenever non-members of the organisation are involved, such flights represent only a marginal activity of the organisation.

(b) Aircraft operated under MCAR-Part-NCO by its owner together with an ATO or a DTO flight instructor for the purpose of training, when the contract between the owner and the training organisation and the procedures of the training organisation allow it. The continuing airworthiness of such aircraft remains under the responsibility of the owner, or of the CAMO or CAO contracted by the owner, if the owner has elected to contract a CAMO or CAO in accordance with ML.A.201(f).

(c) Aircraft used for very limited training flights due to the specific configuration of the aircraft and limited need for such flights.

GM1 ML.A.201(f) Responsibilities

If an owner (see definition in point ML.1(c)(3)) decides not to make a contract with a CAMO or CAO, the owner is fully responsible for the proper accomplishment of the corresponding continuing airworthiness management tasks. As a consequence, it is expected that the owner properly and realistically self-assesses his or her own competence to accomplish those tasks or otherwise seek the necessary expertise.

GM1 ML.A.201(h) Responsibilities

USE OF AIRCRAFT INCLUDED IN AN AOC FOR NON-COMMERCIAL OPERATIONS OR SPECIALISED OPERATIONS

As point (h) is not a derogation, points ML.A.201(e) and (f) are still applicable. Therefore, the management of continuing airworthiness of the aircraft by the CAMO or CAO of the AOC holder means that the other operator has established a written contract as per Appendix I to Part-ML with this CAMO or CAO.

ML.A.202 Occurrence reporting

(a) Without prejudice to the reporting requirements set out in MCAR-Part-145 and MCAR-Part-CAMO, any person or organisation responsible in accordance with point ML.A.201 shall report any identified condition of an aircraft or component which endangers flight safety to:

(1) the Authority;

(2) to the organisation responsible for the type design or supplemental type design.

(b) The reports referred to in point (a) shall be made in a manner determined by the Authority and shall contain all pertinent information about the condition known to the person or organisation making the report.

(c) Where the maintenance or the airworthiness review of the aircraft is carried out on the basis of a written contract, the person or the organisation responsible for those activities shall also report any condition referred to in point (a) to the owner of the aircraft and, when different, to the CAMO or CAO concerned.

(d) The person or organisation shall submit the reports referred to in points (a) and (c) as soon as possible, but no later than 96 hours from the moment when the person or organisation identified the condition to which the report relates, unless exceptional circumstances prevent this.

AMC1 ML.A.202 Occurrence reporting

Accountable persons or organisations should ensure that the design approval holder (DAH) receives adequate reports of occurrences for that aircraft or component, to enable the DAH to issue appropriate service instructions and recommendations to all owners or operators.

Accountable persons or organisations should establish a liaison with the DAH to determine whether published or proposed service information will resolve the problem or to obtain a solution to a particular problem.

AMC-20 ‘General Acceptable Means of Compliance for Airworthiness of Products, Parts and Appliances’ provides further details on occurrence reporting (AMC 20-8).

SUBPART C — CONTINUING AIRWORTHINESS

ML.A.301 Continuing-airworthiness tasks

The aircraft continuing airworthiness and the serviceability of operational and emergency equipment shall be ensured by:

(a) the accomplishment of pre-flight inspections;

(b) the rectification of any defect and damage affecting safe operation in accordance with data specified in points ML.A.304 and ML.A.401, as applicable, while taking into account the minimum equipment list ('MEL') and configuration deviation list, when they exist;

(c) the accomplishment of all maintenance in accordance with the AMP referred to in point ML.A.302;

(d) the accomplishment of any applicable:

(1) airworthiness directive ('AD');

(2) operational directive with a continuing-airworthiness impact;

(3) continuing-airworthiness requirement established by the Authority;

(4) measure required by the Authority as an immediate reaction to a safety problem;

(e) the accomplishment of modifications and repairs in accordance with point ML.A.304;

(f) maintenance check flights, when necessary.

GM1 ML.A.301(f) Continuing airworthiness tasks

MAINTENANCE CHECK FLIGHTS (MCFs)

(a) The definition of and operational requirements for MCFs are laid down in Section 5 of Subpart E of MCAR-Part-SPO and are carried out under the control and responsibility of the aircraft operator. During the flight preparation, the flight and the post-flight activities as well as for the aircraft handover, the processes requiring the involvement of maintenance personnel or organisations should be agreed in advance with the operator. The operator should consult as necessary with the person or organisation in charge of the airworthiness of the aircraft.

(b) Depending on the aircraft defect and the status of the maintenance activity performed before the flight, different scenarios are possible and are described below:

(1) The aircraft maintenance manual (AMM), or any other maintenance data issued by the DAH, requires that an MCF be performed before completion of the maintenance ordered. In this scenario, a certificate after incomplete maintenance, when in compliance with ML.A.801(f) or 145.A.50(e), should be issued and the aircraft can be flown for this purpose under its airworthiness certificate.

Due to incomplete maintenance, it is advisable to open a new entry into the ML.A.305 aircraft logbook, to identify the need for an MCF. This new entry should contain or refer to, as necessary, data relevant to perform the MCF, such as aircraft limitations and any potential effect on operational and emergency equipment due to incomplete maintenance, maintenance data reference and maintenance actions to be performed after the flight.

After a successful MCF, the maintenance records should be completed, the remaining maintenance actions finalised and a certificate of release to service (CRS) issued.

(2) Based on its own experience and for reliability considerations and/or quality assurance, an operator, owner, CAO or CAMO may wish to perform an MCF after the aircraft has undergone certain maintenance while maintenance data does not call for such a flight. Therefore, after the maintenance has been properly carried out, a CRS is issued and the aircraft airworthiness certificate remains valid for this flight.

(3) After troubleshooting of a system on the ground, an MCF is proposed by the maintenance personnel or organisation as confirmation that the solution applied has restored the normal system operation. During the maintenance performed, the maintenance instructions are followed for the complete restoration of the system and therefore a CRS is issued before the flight. The airworthiness certificate is valid for the flight. An open entry requesting this flight may be recorded in the aircraft logbook.

(4) An aircraft system has been found to fail, the dispatch of the aircraft is not possible in accordance with the maintenance data, and the satisfactory diagnosis of the cause of the fault can only be made in flight. The process for this troubleshooting is not described in the maintenance data and therefore scenario (1) does not apply. Since the aircraft cannot fly under its airworthiness certificate because it has not been released to service after maintenance, a permit to fly issued in accordance with the Civil Aviation Regulations is required.

After the flight and the corresponding maintenance work, the aircraft can be released to service and continue to operate under its original certificate of airworthiness.

(c) For certain MCFs, the data obtained or verified in flight will be necessary for assessment or consideration after the flight by the maintenance personnel or organisation prior to issuing the maintenance release. For this purpose, when

the maintenance staff cannot perform these functions in flight, it may rely on the crew performing the flight to complete this data or to make statements about in-flight verifications. In this case, the maintenance staff should appoint the crew personnel to play such a role on their behalf and, before the flight, brief the appointed crew personnel on the scope, functions and the detailed process to be followed, including required reporting information after the flight and reporting means, in support of the final release to service to be issued by the certifying staff.

ML.A.302 Aircraft maintenance programme

(a) The maintenance of each aircraft shall be organised in accordance with an AMP.

(b) The AMP and any subsequent amendments thereto shall be, alternatively:

(1) declared by the owner in accordance with point (c)(7) of point ML.A.302, where the continuing airworthiness of the aircraft is not managed by a CAMO or CAO;

(2) approved by the CAMO or CAO responsible for managing the continuing airworthiness of the aircraft.

The owner declaring the AMP in accordance with point (b)(1) or the organisation approving the AMP in accordance with point (b)(2) shall keep the AMP updated.

(c) The AMP:

(1) shall clearly identify the owner of the aircraft and the aircraft to which it relates, including any installed engine and propeller, as applicable;

(2) shall include, alternatively:

(a) the tasks or inspections contained in the applicable minimum inspection programme ('MIP') referred to in point (d);

(b) the instructions for continuing airworthiness ('ICA') issued by the design approval holder ('DAH');

(3) may include additional maintenance actions to those referred to in point (c)(2) or maintenance actions alternative to those referred to in point (c)(2)(b) at the proposal of the owner, CAMO or CAO, once approved or declared in accordance with point (b). Alternative maintenance actions to those referred to in point (c)(2)(b) shall not be less restrictive than those set out in the applicable MIP;

(4) shall include all the mandatory continuing airworthiness information, such as repetitive ADs, the airworthiness limitation section ('ALS') of the

ICAs, and specific maintenance requirements contained in the type certificate data sheet ('TCDS');

(5) shall identify any additional maintenance tasks to be performed because of the specific aircraft type, aircraft configuration and type and specificity of operation, whereas the following elements shall be taken into consideration as a minimum:

(a) specific installed equipment and modifications of the aircraft;

(b) repairs carried out in the aircraft;

(c) life-limited components and flight-safety-critical components;

(d) maintenance recommendations, such as time between overhaul ('TBO') intervals, issued through service bulletins, service letters, and other non-mandatory service information;

(e) applicable operational directives or requirements related to the periodic inspection of certain equipment;

(f) special operational approvals;

(g) use of the aircraft and operational environment;

(6) shall identify whether the Pilot-owners are authorised to perform maintenance;

(7) when declared by the owner, shall contain a signed statement by which the owner declares that this is the AMP for the particular aircraft registration and that he is fully responsible for its content and, in particular, for any deviations from the DAH's recommendations;

(8) when approved by the CAMO or CAO, shall be signed by this organisation, which shall retain records with the justification for any deviation introduced to the DAH's recommendations;

(9) shall be reviewed at least annually in order to assess its effectiveness, and this review shall be performed, alternatively:

(a) in conjunction with the airworthiness review of the aircraft by the person who performs such an airworthiness review;

(b) by the CAMO or CAO managing the continuing airworthiness of the aircraft in those cases where the review of the AMP is not performed in conjunction with an airworthiness review.

If the review shows deficiencies of the aircraft linked with deficiencies in the content of the AMP, the AMP shall be amended accordingly. In this case the person performing the review shall inform the Authority if he does not agree with the measures amending the AMP taken by the owner, CAMO or CAO. The Authority shall decide which amendments

to the AMP are necessary, raising the corresponding findings and, if necessary, reacting in accordance with point ML.B.304.

(d) A MIP:

(1) shall contain the following inspection intervals:

(a) for aeroplanes, touring motor gliders ('TMGs') and balloons, every annual or 100-h interval, whichever comes first, to which a tolerance of 1 month or 10 h may be applied. The next interval shall be calculated as from the time the inspection takes place;

(b) for sailplanes and powered sailplanes other than TMG, every annual interval to which a tolerance of 1 month may be applied. The next interval shall be calculated as from the time the inspection takes place;

(2) shall contain the following, as applicable to the aircraft type:

(a) servicing tasks as required by the DAH's requirements;

(b) inspection of markings;

(c) review of weighing records and weighing in accordance with CAT.POL.MAB.100 of MCAR-Part-CAT, BOP.BAS.205 of this MCAR and SAO.POL.100 of MCAR-Sailplanes;

(d) operational test of transponder (if installed);

(e) functional test of the pitot-static system;

(f) in the case of aeroplanes:

(i) operational tests for power and revolutions per minute (rpm), magnetos, fuel and oil pressure, engine temperatures;

(ii) for engines equipped with automated engine control, the published run-up procedure;

(iii) for dry-sump engines, engines with turbochargers and liquid-cooled engines, an operational test for signs of disturbed fluid circulation;

(g) inspection of the condition and attachment of the structural items, systems and components corresponding to the following areas:

(i) for aeroplanes:

airframe, cabin and cockpit, landing gear, wing and centre section, flight controls, empennage, avionics and electrics, power plant, clutches and gearboxes, propeller and

miscellaneous systems, such as the ballistic rescue system;

(ii) for sailplanes and powered sailplanes:

airframe, cabin and cockpit, landing gear, wing and centre section, empennage, avionics and electrics, power plant (for powered sailplanes) and miscellaneous systems, such as removable ballast and/or drag chute and controls, as well as water ballast system;

(iii) for hot-air balloons:

envelope, burner, basket, fuel containers, equipment and instruments;

(iv) for gas balloons:

envelope, basket, equipment and instruments.

As long as Part-ML to this MCAR does not specify an MIP for airships and rotorcraft, their AMP shall be based on the ICA issued by the DAH, as referred to in point (c)(2)(b).

(e) By derogation from points (b) and (c), a declaration by the owner or an approval by a CAMO or CAO is not required, and an AMP document is not required to be produced when the following conditions are met:

(1) all the ICA issued by the DAH are being followed without any deviations;

(2) all maintenance recommendations, such as TBO intervals, issued through service bulletins, service letters, and other non-mandatory service information, are being followed without any deviations;

(3) there are no additional maintenance tasks to be performed resulting from any of the following:

(a) specific installed equipment and modifications of the aircraft;

(b) repairs carried out in the aircraft;

(c) life-limited components and flight-safety-critical components;

(d) special operational approvals;

(e) use of the aircraft and operational environment.

(4) Pilot-owners are authorised to perform Pilot-owner maintenance.

This derogation is not applicable if the pilot-owner or, in case of jointly-owned aircraft, any of the pilot-owners is not authorised to perform Pilot-owner maintenance because this has to be specified in the declared or approved AMP.

(f) If the conditions provided for in points (e)(1) to (e)(4) are met, the AMP applicable to the aircraft shall consist of the following:

(1) the ICA issued by the DAH;

(2) the maintenance recommendations, such as TBO intervals, issued through service bulletins, service letters, and other non-mandatory service information;

(3) the mandatory continuing airworthiness information, such as repetitive ADs, the ALS of the ICA and specific maintenance requirements contained in the TCDS;

(4) the tasks due to specific operational or airspace directives or requirements in relation to particular instruments and equipment.

AMC1 ML.A.302 Aircraft maintenance programme

(a) The aircraft should only be maintained according to one maintenance programme at a given point in time. Where an owner wishes to change from one programme to another (e.g. from an AMP based on minimum inspection programme (MIP) to an AMP based on DAH's data), certain additional maintenance may need to be carried out on the aircraft to implement this transition.

(b) The maintenance programme may take the format of the standard template provided in AMC2 ML.A.302 (DCA Form AMP). This maintenance programme may include several aircraft registrations as long as the maintenance requirements for each registration are clearly identified.

AMC2 ML.A.302 Aircraft maintenance programme

DCA FORM AMP

The following DCA Form AMP may be used to produce the AMP:

<table>
<tr><th colspan="4">Part-ML aircraft maintenance programme (AMP)</th></tr>
<tr><th colspan="4">Aircraft identification</th></tr>
<tr><td rowspan="2">1</td><td>Registration(s):</td><td>Type:</td><td>Serial no(s):</td></tr>
<tr><td colspan="3">Owner:</td></tr>
<tr><th colspan="4">Basis for the maintenance programme</th></tr>
<tr><td>2</td><td colspan="2">Design approval holder (DAH) instructions for continued airworthiness (ICA) ☐</td><td>Minimum inspection programme (MIP) as detailed in the latest revision of AMC1 ML.A.302(d) ☐
Other MIP complying with ML.A.302(d) ☐
(List the tasks in Appendix A)</td></tr>
<tr><th colspan="4">Design approval holder (DAH)
instructions for continuing airworthiness (ICA)</th></tr>
</table>

3	Equipment manufacturer and type		Applicable ICA reference (revision/date not required assuming the latest revision will always be used)
For aircraft other than balloons			
3 a	Aircraft (other than balloons)		
3 b	Engine (if applicable)		
3c	Propeller (if applicable)		
For balloons			
3 d	Envelope (only for balloons)		
3 e	Basket(s) (only for balloons)		
3f	Burner(s) (only for balloons)		
3 g	Fuel cylinders (only for balloons)		

Additional maintenance requirements to the DAH' ICA or to the MIP (applicable to all AMPs)			
4	Indicate if any of the following types of repetitive maintenance are included in the AMP (when replying 'YES', list the specific requirements in Appendix B)	Yes	No
	Maintenance due to specific equipment and modifications		
	Maintenance due to repairs		
	Maintenance due to life-limited components (this should be only if the MIP is used. Otherwise, this data is already part of the DAH's data used as a basis for the AMP.)		
	Maintenance due to mandatory continuing airworthiness information (airworthiness limitations (ALIs), certification maintenance requirements (CMRs), specific requirements in the TCDS, etc.)		
	Maintenance recommendations, such as time between overhaul (TBO) intervals, issued through service bulletins, service letters, and other non-mandatory service information		
	Maintenance due to repetitive ADs		
	Maintenance due to specific operational/airspace directives/requirements (altimeter, compass, transponder, etc.)		
	Maintenance due to the type of operation or operational approvals		
	Other		
Maintenance tasks alternative to the DAH's ICA (not less restrictive than the MIP)			
5	Indicate if there is any maintenance task alternative to the DAH's ICA (when 'YES', list the specific alternative maintenance tasks in Appendix C)	Yes	No
Pilot-owner maintenance (only for balloons not operated under Subpart-ADD, or sailplanes not operated under Subpart-DEC, or other aircraft operated under Part-NCO) Remark: pilot-owner maintenance is not allowed for aircraft operated by a commercial ATO/DTO			
6	Does the pilot-owner perform pilot-owner maintenance (ref. ML.A.803)? If yes, enter the name of the pilot-owner(s) authorised to perform such maintenance: Pilot-owner name:_(NOTE)_____Licence number: (NOTE)_____ Signature: _____Date: _____ NOTE: It is possible to refer to a list in the case of jointly owned aircraft.	Yes	No
Approval/declaration of the maintenance programme (select the appropriate option)			
7	Declaration by the owner: ☐	Approval by the contracted CAMO/CAO:☐	

	'I hereby declare that this is the maintenance programme applicable to the aircraft referred to in block 1, and I am fully responsible for its content and, in particular, for any alternatives tasks to the DAH's data.' Signature/name/date:	Approval reference no of the CAMO/CAO: Signature/name/date:
Certification statement		
8	'I will ensure that the aircraft is maintained in accordance with this maintenance programme and that the maintenance programme will be reviewed and updated as required.' Signed by the person/organisation responsible for the continuing airworthiness of the aircraft according to ML.A.201: Owner/Lessee/operator ☐ CAMO/CAO ☐ Name of owner/lessee/operator or CAMO/CAO approval number: Address: Telephone/fax: Email: Signature/date:	
9	Appendices attached: Appendix A YES ☐ NO ☐ Appendix B YES ☐ NO ☐ Appendix C YES ☐ NO ☐ Appendix D YES ☐ NO ☐	

Appendix A — Minimum inspection programme (MIP) **(only applicable if a MIP different from the one described in AMC1 ML.A.302(d) is used — see Section 2 above)**
Detail the tasks and inspections contained in the MIP being used.

Appendix B — Additional maintenance requirements **(include only if necessary — see Section 4 above)**		
This appendix is supposed to include only the tasks which are included in the AMP, either at the recommended interval or at a different one. *(All repetitive maintenance tasks not included here, or the interval differences should be kept by the CAMO/CAO (when contracted) in their files with their corresponding justifications. Appendix D may optionally be used. Nevertheless, the owner/CAMO/CAO is responsible for taking into account all instructions, even if they are not adopted and listed here. The person performing the AR, if reviewing the AMP, is not responsible for the completeness of this appendix, but may do some sampling as part of the investigations and the findings discovered during the physical review).*		
Task description	References	Interval (tick box if the selected interval differs from that required in the referenced document)
Maintenance due to specific equipment and modifications		
		☐
		☐
Maintenance due to repairs		
		☐
		☐
Maintenance due to life-limited components (This should be only if the MIP is used. Otherwise, this data is already part of the DAH's data used as the basis for the AMP.)		
		☐

		☐
Maintenance due to mandatory continuing airworthiness instructions (ALIs, CMRs, specific requirements in the TCDS, etc.)		
		☐
		☐
Maintenance recommendations, such as TBO intervals, issued through service bulletins, service letters, and other non-mandatory service information		
		☐
Emergency locator transmitters and personal locator beacon — annual testing	EASA SIB 2019-09	1 Year ☐
(if not using MIP or equivalent ICA task) Transponder test	EASA SIB 2011-15	2 Years ☐
		☐
Maintenance due to repetitive ADs		
		☐
		☐
Maintenance due to specific operational/airspace directives/requirements (altimeter, compass, transponder, etc.)		
		☐
		☐
Maintenance due to the type of operation or operational approvals		
		☐
		☐
Other		
		☐
		☐

Appendix C — Maintenance tasks alternative to the DAH's ICA (not less restrictive than the MIP) **(include only if necessary — see Sections 5 above)**			
Task description	Recommended interval	Alternative inspection/task	Amended interval
When the DAH's ICA are used as the basis for the AMP, this appendix is used to include the tasks alternative to the DAH's ICA, which are included in the AMP. *(When a CAMO/CAO is contracted, all elements justifying the deviations from the DAH's ICA should be kept by the CAMO/CAO and the organisation should provide a copy of these justifications to the owner)*			

Appendix D — Additional information (optional)
This appendix may optionally be used to provide additional information, such as the complete list of AMP tasks or the list of documents (e.g. service bulletins) considered during the development of the AMP.

GM1 ML.A.302 Aircraft maintenance programme

The responsibilities associated with maintenance programmes developed in accordance with ML.A.302 are the following:

(a) If the owner has contracted a CAMO or CAO in order to manage the continuing airworthiness of the aircraft, this organisation is responsible for developing and approving a maintenance programme which:

(1) indicates whether this programme is based on data from the DAH or on the MIP described in ML.A.302(d);

(2) identifies the owner and the specific aircraft, engine, and propeller (as applicable);

(3) includes all mandatory continuing airworthiness information and any additional tasks derived from the assessment of the DAH's instructions;

(4) justifies any deviations from the DAH's instructions; when the DAH's instructions are the basis for the AMP development, these deviations should not fall below the requirements of the MIP; and

(5) is customised to the particular aircraft type, configuration and operation, in accordance with ML.A.302(c)(5).

(b) If the owner has not contracted a CAMO or CAO in order to manage the continuing airworthiness of the aircraft, then the owner is responsible for developing and declaring the maintenance programme, assuming full responsibility for its content, and for any deviations from the DAH's instructions (ref. ML.A.201(f) and ML.A.302(c)(7)) and the possible consequences of such deviations. In this case, these deviations do not need to be justified, but are to be identified in the AMP. However, the maintenance programme still needs to comply with the requirements contained in ML.A.302(c), in particular with the obligation to not fall below the requirements of the MIP and to comply with the mandatory continuing airworthiness information.

(c) The content of the owner-declared maintenance programme cannot be challenged up front either by the Authority or by the contracted maintenance organisation. This declared maintenance programme is the basis for adequate planning of maintenance, as well as for the ARs and the aircraft continuing airworthiness monitoring (ACAM) inspections in accordance with ML.B.303. Nevertheless, the maintenance programme will be subject to periodic reviews at the occasion of the AR and, in case of discrepancies, linked with deficiencies in the content of the maintenance programme, the owner shall amend the maintenance programme accordingly, as required by ML.A.302(c)(9).

(d) When Authority is notified of deficiencies linked with the content of the declared maintenance programme for a particular aircraft (in case no agreement is reached between the owner and the AR staff about the changes required in the maintenance programme), the Authority should contact the owner, request a

copy of the maintenance programme, decide which amendment to the AMP is necessary and raise the associated finding (ref. ML.A.302(c)(9)). If necessary, the Authority may also react in accordance with ML.B.304. Based on the information received, the reported deficiencies and the identified risks, the Authority may in addition adapt the ACAM programme accordingly (ref. ML.B.303).

(e) Although there is no requirement for the owner to send a copy of the maintenance programme to the Authority, this does not prevent the Authority from requesting at any time the owner to send information about, or a copy of the AMP, even if deficiencies have not been reported (see AMC1 ML.B.201).

(f) Since the maintenance programme has to identify the alternatives tasks to the DAH's instructions, the ARs and ACAM inspections can place emphasis on the inspection of the areas affected by those deviations in order to make sure that the maintenance programme is effective.

(g) Since the Authority is not responsible for the content of a declared maintenance programme, the Authority does not authorise the accomplishment of the scheduled maintenance to deviate from the AMP content (other than the tolerances provided for in ML.A.302(d)(1)). In such cases, the owner may declare an amended AMP.

GM2 ML.A.302 Aircraft maintenance programme

The following table provides a summary of the provisions contained in ML.A.302 in relation to the content of the maintenance programme, its approval and its link with the AR:

	OPTION 1	OPTION 2
Responsibility for developing the AMP	Contracted CAMO or CAO	Owner (if allowed under ML.A.201(f))
Approval/declaration of the maintenance programme	Approved by the CAMO or CAO, or none required in case of compliance with ML.A.302(e)	Declaration by the owner or none required in case of compliance with ML.A.302(e)
Basis for the maintenance programme	MIP (not applicable to rotorcraft and airships) or ICA issued by the DAH	
Deviations from the DAH's ICA	Deviations from the DAH's instructions are justified. The CAMO/CAO keeps a record of the justifications and provides a copy of them to the owner.	Deviations do not need to be justified.
AMP annual review	In conjunction with the AR, by the AR staff or, if not performed in conjunction with the AR (e.g. in case of ARC extension), by the CAMO or CAO.	

AMC1 ML.A.302(c) Aircraft maintenance programme

When evaluating an alternative to a maintenance task issued or recommended by the DAH, such as the extension of TBO intervals, or when considering not to include a maintenance task issued or recommended by the DAH, a risk-based approach should

be taken, considering aspects such as the operation of aircraft, type of aircraft, hours and years in service, maintenance of the aircraft, compensating measures, redundancy of components, etc.

The following table provides more details of aspects that should be considered:

	Examples
OPS approval	HIGHER RISK: commercial operation, commercial flight training MEDIUM RISK: flight training by an association, non-commercial specialised operations (SPO) LOWER RISK: private
Flight rules	HIGHER RISK: instrument flight rules (IFR) MEDIUM RISK: visual flight rules (VFR) at night LOWER RISK: VFR by day
Aircraft weight	HIGHER RISK: Other than ELA1 MEDIUM RISK: ELA1 aircraft other than light sport aeroplanes (LSA), very light aircraft (VLA), sailplanes and powered sailplanes LOWER RISK: LSA, VLA, sailplanes and powered sailplanes
Who manages the airworthiness of the aircraft?	HIGHER RISK: owner LOWER RISK: CAMO/CAO
Who maintains the aircraft?	HIGHER RISK: pilot-owner MEDIUM RISK: independent certifying staff LOWER RISK: maintenance organisation
Time in service (flight hours, years)	HIGHER RISK: very high number of hours or years MEDIUM RISK: medium number of hours or years LOWER RISK: low number of hours or years
Aircraft utilisation	HIGHER RISK: less than 50 h per year MEDIUM RISK: around 200 h per year LOWER RISK: more than 400 h per year
ACAM findings	HIGHER RISK: numerous findings in ACAM or ramp inspections MEDIUM RISK: few findings in ACAM inspections LOWER RISK: rare findings in ACAM inspections
System redundancy (for components such as engine/propeller)	HIGHER RISK: single-engined aircraft LOWER RISK: multi-engined aircraft
Supplementary maintenance measures	HIGHER RISK: no supplementary measures LOWER RISK: supplementary measures (such as oil analysis, engine data monitoring, boroscope inspections, corrosion inspections, etc.)
Risk factor of the component failure	HIGHER RISK: engine failure on a helicopter MEDIUM RISK: engine failure on an aeroplane LOWER RISK: sailplane, or powered sailplane

The above information may be useful for CAMOs and CAOs when developing and approving maintenance programmes, and for the AR staff performing ARs and reviewing the effectiveness of the declared maintenance programme. It may also be useful for the owner in order to take an informed decision before introducing deviations from the DAH's recommendations. Nevertheless, as allowed by ML.A.302(c)(7) and explained in GM ML.A.302, when the owner issues a declaration for the maintenance programme, they do not need to justify such deviations.

AMC1 ML.A.302(c)(9) Aircraft maintenance programme

ANNUAL REVIEW OF THE AMP

(a) During the annual review of the maintenance programme, as required by point ML.A.302(c)(9), the following should be taken into consideration:

(1) the results of the maintenance performed during that year, which may reveal that the current maintenance programme is not adequate;

(2) the results of the AR performed on the aircraft, which may reveal that the current maintenance programme is not adequate;

(3) revisions introduced on the documents affecting the programme basis, such as the ML.A.302(d) MIP or the DAH's data;

(4) changes in the aircraft configuration, and type and specificity of operation;

(5) changes in the list of pilot-owners; and

(6) applicable mandatory requirements for compliance with MCAR-Part-21, such as airworthiness directives (ADs), airworthiness limitations, certification maintenance requirements and specific maintenance requirements contained in the type certificate data sheet (TCDS).

(b) When reviewing the effectiveness of the AMP, the AR staff (or the CAMO/CAO staff if the review of the AMP is not performed in conjunction with an AR) may need to review the maintenance carried out during the last 12 months, including unscheduled maintenance. To this end, he or she should receive the records of all the maintenance performed during that year from the owner/CAMO/CAO.

(c) When reviewing the results of the maintenance performed during that year and the results of the AR, attention should be paid as to whether the defects found could have been prevented by introducing in the maintenance programme certain DAH's recommendations, which were initially disregarded by the owner, CAMO or CAO.

GM1 ML.A.302(c)(2)(b) Aircraft maintenance programme

'DAH' refers to the holder of a type certificate (TC), restricted type certificate, supplemental type certificate (STC), European Technical Standard Order (ETSO) authorisation, repair or change to the type design.

The 'instructions for continuing airworthiness ('ICA') issued by the design approval holder ('DAH')' do not include the data issued by other original equipment manufacturer (OEM), except when the DAH's ICA makes clear reference to such OEM data.

Tasks or intervals (e.g. escalations) alternative to those of the DAH's ICA and selected by the CAMO or CAO for the AMP do not need to be approved by the Authority. Justification of these deviations are to be kept by the CAMO or CAO.

GM1 ML.A.302(c)(3) Aircraft maintenance programme

ALTERNATIVE MAINTENANCE ACTIONS

'Maintenance actions alternative to those referred to in point (c)(2)(b)' refer to when the DAH's ICA are used as the basis for the AMP development and the CAMO, CAO or owner (as applicable), when developing the AMP, decides to deviate from certain of these DAH's instructions, introducing, for example, a less frequent interval or a different task type (inspection instead of check) than the one established by the ICA.

These alternative maintenance actions shall not be less restrictive than those set out in the applicable MIP. This means that the extent of the maintenance to be covered by the deviating task cannot be less than the extent of the corresponding task in the MIP in terms of frequency and task type.

Examples of alternative maintenance actions:

ICA task	AMP proposed alternative	MIP task	Alternative acceptable Yes/No
Inspection XX 6 months interval	Inspection XX 12 months interval	Inspection XX 12 months interval	Yes
Inspection XX 12 months interval	Inspection XX 24 months interval	Inspection XX 12 months interval	No
Inspection XX 24 months interval	Inspection XX 36 months interval	Inspection XX 12 months interval	No (24 months to be kept)
Functional test system XX	Operational test system XX (same interval) or general visual inspection system XX (same interval)	Functional test system XX (same interval)	No*
Operational test system XX	Functional test system XX (same interval)	Operational test system XX (same interval)	Yes*
Inspection XX 24 months interval	Inspection XX 36 months	None relevant	Yes
Functional test	General visual inspection	None relevant	Yes

*A functional test is considered more restrictive than an operational test.

Remark: the above does not apply to one-time interval extensions, for which ML.A.302(d)(1) provides 1-month or 10-h tolerance (i.e. permitted variation) for aeroplanes, touring motor gliders (TMGs) and balloons and 1-month tolerance for sailplanes and powered sailplanes other than TMGs.

GM1 ML.A.302(c)(4) Aircraft maintenance programme

MANDATORY CONTINUING AIRWORTHINESS INFORMATION OTHER THAN ADS

'Mandatory continuing airworthiness information' other than ADs may be different from one aircraft to another, depending on the type certification basis used. The aircraft may have been certified before the term 'ALS (Airworthiness Limitations Section)' was introduced in the certification specification (or airworthiness code). However, the intent is that the AMP (whether based on MIP or not) includes all mandatory scheduled maintenance requirements identified during the initial airworthiness activity, by the TC holder, STC holder and, if applicable, engine TC holder. These requirements may be identified under a variety of designations such as:

- Airworthiness limitations or Airworthiness limitation items (ALI)
- Certification maintenance requirements (CMR)
- Safe life items or safe life limits or safe life limitations
- Life-limited parts (LLP)
- Time limits
- Retirements life
- Mandatory Inspections or Mandatory Airworthiness Inspections
- Fuel airworthiness limitations or Fuel tank safety limitations

In case of doubt, it is advised to check the TCDS or contact the DAH.

The intervals of the mandatory continuing airworthiness information cannot be extended by a CAMO/CAO. The escalation of such tasks is to be approved by the Authority.

AMC1 ML.A.302(d) Aircraft maintenance programme

This AMC contains an acceptable MIP for aeroplanes of 2 730 kg maximum take-off mass (MTOM) and below, and for ELA2 aircraft other than rotorcraft or airships, grouped in the following categories:

- aeroplanes of 2 730 kg MTOM and below;
- ELA2 sailplanes and ELA2 powered sailplanes; and
- ELA2 balloons.

These MIPs already comply with the requirements of ML.A.302(d) and may be used in order to define the basic information for the maintenance programme as required

by ML.A.302(c)(2)(a). However, the maintenance programme must be customised as required by ML.A.302(c)(5), which may be achieved by using the standard template contained in AMC ML.A.302.

It should be noted that using the 1-month tolerance permitted by ML.A.302(d)(1) for the annual inspection may result in an expired ARC.

MIP for aeroplanes of 2 730 kg MTOM and below

To be performed at every annual/100-h interval, whichever comes first.

A tolerance of 1 month or 10 h may be applied. The next interval shall be calculated from the time the inspection takes place.

Note 1: Use the manufacturer's maintenance manual to accomplish each task/inspection.

Note 2: Proper operation of backup or secondary systems and components should be performed wherever a check for improper installation/operation is carried out.

Aeroplanes of 2 730 kg MTOM and below	
System/component/area	**Task and inspection detail**
GENERAL	
General	Remove or open all necessary inspection plates, access doors, fairings, and cowlings. Clean the aircraft and aircraft engine as required.
Lubrication/servicing	Lubricate and replenish fluids in accordance with the manufacturer's requirements.
Markings	Check that side and underwing registration markings are correct. If applicable, check that an exemption for alternate display is approved. Identification plate for national aviation authority (NAA)-registered aircraft is present, as well as other identification markings on fuselage in accordance with local (national) rules.
Weighing	Review weighing record to establish accuracy against installed equipment. Weigh the aircraft as required by MCAR-Part-NCO or MCAR-Part-SPO, as applicable.
Service life limits	Check the records that the service life limits and airworthiness limits are within the life time limits of the maintenance programme.
Software	Check for updated software/firmware status and databases for engine and equipment.
AIRFRAME	
Fabric and skin	Inspect for deterioration, distortion, other evidence of failure, and defective or insecure attachment of fittings. NOTE: When checking composite structures, check for signs of impact or pressure damage that may indicate underlying damage.
Fuselage structure	Check frames, formers, tubular structure, braces, and attachments. Inspect for signs of corrosion and cracks.
Systems and components	Inspect for improper installation, apparent defects, and unsatisfactory operation.
Pitot-static system	Inspect for security, damage, cleanliness, and condition. Drain any water from condensation drains.
General	Inspect for lack of cleanliness and loose equipment that may foul the controls.

Aeroplanes of 2 730 kg MTOM and below	
System/component/area	**Task and inspection detail**
Tow hooks	Inspect for condition of moving parts and wear. Check service life. Carry out operational test.
CABIN AND COCKPIT	
Seats, safety belts and harnesses	Inspect for poor condition and apparent defects. Check for service life.
Windows, canopies and windshields	Inspect for deterioration and damage, and for function of emergency jettison.
Instrument panel assemblies	Inspect for poor condition, mounting, marking, and (where practicable) improper operation. Check markings of instruments in accordance with the flight manual.
Flight and engine controls	Inspect for improper installation and improper operation.
Speed/weight/manoeuvre placard	Check that the placard is correct and legible, and accurately reflects the status of the aircraft.
All systems	Inspect for improper installation, poor general condition, apparent and obvious defects, and insecurity of attachment.
LANDING GEAR	
Shock-absorbing devices	Inspect for improper oleo fluid level. Inspect for wear and deformation of rubber pads, bungees, and springs.
All units	Inspect for poor condition and insecurity of attachment, including the related structure.
Retracting and locking mechanism	Inspect mechanism. Operational check.
Linkages, trusses and members	Inspect for undue or excessive wear fatigue and distortion.
Steering	Inspect the nose/tail wheel steering for proper function and wear.
Hydraulic lines	Inspect for leakage. Check condition and replace if necessary.
Electrical system	Inspect for chafing. Operational check of switches.
Wheels	Inspect for cracks, defects, and condition of bearings.
Tires	Inspect for wear and cuts.
Brakes	Inspect for improper adjustment and wear. Carry out operational test.
Floats and skis	Inspect for insecure attachment and apparent defects.
WING AND CENTRE SECTION	
All components	Inspect all components of the wing and centre section assembly for poor general condition, fabric or skin deterioration, distortion, evidence of failure and insecurity of attachment.
Connections	Inspect main connections (e.g. between wings, fuselage, wing tips) for proper fit, play within tolerances, wear or corrosion on bolts and bushings.
FLIGHT CONTROLS	
Control circuit/stops	Inspect control rods and cables. Check that the control primary stops are secure and make contact.
Control surfaces	Inspect aileron, flap, elevator, air brake and rudder assemblies, hinges, control connections, springs/bungees, tapes and seals. Check full range of motion and free play.
Trim systems	Inspect trim surfaces, controls, and connections. Check full range of motion.

Aeroplanes of 2 730 kg MTOM and below	
System/component/area	**Task and inspection detail**
EMPENNAGE	
All components and systems	Inspect all components and systems that make up the complete empennage assembly for poor general condition, fabric or skin deterioration, distortion, evidence of failure, insecure attachment, improper component installation, and improper component operation.
AVIONICS AND ELECTRICS	
Batteries	Inspect for improper installation, improper charge, spillage and corrosion.
Radio and electronic equipment	Inspect for improper installation and insecure mounting. Carry out ground function test.
Wiring and conduits	Inspect for improper routing, insecure mounting, and obvious defects.
Bonding and shielding	Inspect for improper installation, poor condition, chafing and wear of insulation.
Antennas	Inspect for poor condition, insecure mounting, and improper operation.
Lights	Operational check of the interior, exterior and instrument lightning
POWER PLANT (OTHER THAN TURBOPROP ENGINE)	
Engine section	Inspect for visual evidence of oil, fuel or hydraulic leaks and sources of such leaks.
Studs and nuts	Inspect for looseness, signs of rotation and obvious defects.
Internal engine	Inspect for proper cylinder compression (record measures for each cylinder) and for metal particles or foreign matter in oil filter, screens and sump drain plugs.
Engine mounts	Inspect for cracks, looseness of mounting, and looseness of the engine to the engine-mount attachment.
Flexible vibration dampeners	Inspect for poor condition and deterioration.
Engine controls	Inspect for defects, improper travel, and improper safe tying.
Lines, hoses and clamps	Inspect for leaks, improper condition, and looseness.
Exhaust stacks	Inspect for cracks, defects, and improper attachment.
Turbocharger and intercooler	Inspect for leaks, improper condition, and looseness of connections and fittings. Check MP controller or density controller for leakage and free movement of controls. Check waste gate or overpressure relief valve for free movements.
Heating	Inspect cabin heating heat exchanger for improper condition and function. For exhaust heat exchanger, check CO (Carbon Monoxide) concentration.
Liquid cooling systems	Inspect for leaks and proper fluid level.
Electronic engine control	Inspect for signs of chafing, and proper electronics and sensor installation.
Accessories	Inspect for apparent defects in security of mounting.
All systems	Inspect for improper installation, poor general condition, defects and insecure attachment.
Cowling	Inspect for cracks and defects. Check cowling flaps.
Cooling baffles and seals	Inspect for defects, improper attachment, and wear.
TURBOPROP ENGINE	
Incoming power check	Perform in accordance with the graphs found in the engine maintenance manual (EMM).

Aeroplanes of 2 730 kg MTOM and below	
System/component/area	**Task and inspection detail**
Inertial separator	Functional check
Engine cowling	Remove, inspect for damage.
General condition	Inspect for oil, fuel, bleed-air or other leaks.
1st stage compressor blades	Remove screen, check for foreign object debris (FOD) or other damage.
P3 filter	Replace
Oil filter	Inspection and cleaning
Fuel low pressure filter	Replace
Fuel high pressure filter	Inspection and cleaning
Oil scavenge filter	Inspection and cleaning
Chip detector	Inspection and cleaning
Exhaust duct	Inspection
Starter/generator brushes	Inspection for proper length
Ignitor/glow plugs	Functional check
Overspeed governor	Inspect for oil leaks.
Governor and beta-valve	Inspect for oil leaks or binding of controls.
Propeller	Inspect blades for damage and hub leaks.
(if installed) fire detector loop or sense module	Functional check
Engine cowling	Install
Power check	Perform in accordance with the graphs found in the EMM, record values.
Oil level	Check within 10 minutes after shutdown.
FUEL	
Fuel tanks	Inspect for leaks and improper installation and connection. Verify proper sealing and function of tank drains.
CLUTCHES AND GEARBOXES	
Filters, screens, and chip detectors	Inspect for metal particles and foreign matter.
Exterior	Inspect for oil leaks.
Output shaft	Inspect for excessive bearings' play and condition.
PROPELLER	
Propeller assembly	Inspect for cracks, nicks, binds, and oil leakage.
Propeller bolts	Inspect for proper installation, looseness, signs of rotation, and lack of safe tying.
Propeller control mechanism	Inspect for improper operation, insecure mounting, and restricted travel.
Anti-icing devices	Inspect for improper operation and obvious defects.
MISCELLANEOUS	
Ballistic rescue system	Inspect for proper installation, unbroken activation mechanism, proper securing while on ground, validity of inspection periods of pyrotechnic devices, and parachute-packing intervals.
Other miscellaneous items	Inspect installed miscellaneous items that are not otherwise covered by this listing for improper installation and improper operation.
OPERATIONAL AND FUNCTIONAL CHECKS	
Power and revolutions per minute (rpm)	Check that power output, static and idle rpm are within published limits.
Magnetos	Check for normal function.

Aeroplanes of 2 730 kg MTOM and below	
System/component/area	**Task and inspection detail**
Fuel and oil pressure	Check that they are within normal values. Check fuel pumps for proper operation.
Engine temperatures	Check that they are within normal values.
Engine	For engines equipped with automated engine control (e.g. FADEC), perform the published run-up procedure and check for discrepancies.
Engine	For dry-sump engines, engines with turbochargers and liquid-cooled engines, check for signs of disturbed fluid circulation.
Pitot-static system	Perform functional check.
Transponder	Perform operational check.
Ice protection	Perform operational check of ice protection system.
Fuel quantity indication	Check the fuel quantity indication for proper indication.
Caution and warning	Operational check of cautions and warnings lights.

MIP for ELA2 sailplanes and ELA2 powered sailplanes

To be performed:

- every 100-h/annual interval (for TMGs), whichever comes first; or
- every annual interval (for the rest).

A tolerance of 1 month or 10 h, as applicable, may be applied. The next interval shall be calculated from the time the inspection takes place.

Note 1: Use the manufacturer's maintenance manual to accomplish each task/inspection.

Note 2: In the case of TMGs, it is acceptable to control the hours of use of the aircraft, engine and propeller as separate entities. Any maintenance check to be carried out between two consecutive 100-h/annual inspections may be performed separately on the aircraft, engine and propeller, depending on when each element reaches the corresponding hours. However, at the time of the 100-h/annual, all the elements must be covered.

Note 3: Proper operation of backup or secondary systems and components should be carried out wherever a check for improper installation/operation is performed.

ELA2 sailplanes and ELA2 powered sailplanes	
System/component/area	**Task and inspection detail**
GENERAL	
General — all tasks	The aircraft must be clean prior to inspection. Inspect for security, damage, wear, integrity, whether drain/vent holes are clear, for signs of overheating, leaks, chafing, cleanliness and condition, as appropriate to the particular task. Whilst checking composite structures, check for signs of impact or pressure damage that may indicate underlying damage.
Lubrication/servicing	Lubricate and replenish fluids in accordance with the manufacturer's requirements.
Markings	Check that side and underwing registration markings are correct. If applicable, check that an exemption for alternate display is approved, if

ELA2 sailplanes and ELA2 powered sailplanes	
System/component/area	**Task and inspection detail**
	identification plate for NAA-registered aircraft is present, and if other identification markings on fuselage are in accordance with local (national) rules.
Weighing	Review weighing record to establish accuracy against installed equipment. Weigh the aircraft as required by the relevant Regulation for air operations.
AIRFRAME	
Fuselage paint/gel coat	Inspect external surface and fairings, gel coat, fabric covering or metal skin, and paintwork.
Fuselage structure	Check frames, formers, tubular structure, skin, and attachments. Inspect for signs of corrosion on tubular framework.
Nose fairing	Inspect for evidence of impact with ground or objects.
Release hook(s)	Inspect nose and centre of gravity, release hooks and controls. Check operational life. Carry out operational test. If more than one release hook or control is fitted, check operation of all release hooks from all positions.
Pitot/ventilator	Check alignment of probe, check operation of ventilator.
Pitot-static system	Inspect pitot probes, static ports, and all tubing (as accessible) for security, damage, cleanliness, and condition. Drain any water from condensate drains.
Bonding/vents drains	Check all bonding leads and straps. Check that all vents and drains are clear from debris.
CABIN AND COCKPIT	
Cleanliness/loose articles	Check under cockpit floor/seat pan and in rear fuselage for debris and foreign items.
Canopy, locks and jettison	Inspect canopy, canopy frame and transparencies for cracks, unacceptable distortion, and discolouration. Check operation of all locks and catches. Carry out an operational test of the canopy jettison system from all positions.
Seat/cockpit floor	Inspect seat(s). Check that all loose cushions are correctly installed and, as appropriate, that energy-absorbing foam cushions are fitted correctly. Ensure that all seat adjusters fit and lock correctly.
Harness(es)	Inspect all harnesses for condition, and wear of all fastenings, webbing, and fittings. Check operation of release and adjustments.
Rudder pedal assemblies	Inspect rudder pedal assemblies and adjusters. Inspect cables for wear and damage.
Instrument panel assemblies	Inspect instrument panel and all instruments/equipment. Check if instrument readings are consistent with ambient conditions. Check marking of all switches, circuit breakers, and fuses. Check operation of all installed equipment, as possible in accordance with the manufacturer's instructions. Check markings of instruments in accordance with the aircraft flight manual (AFM).
Oxygen system	Inspect oxygen system. Check bottle hydrostatic-test date expiry in accordance with the manufacturer's recommendations. Ensure that oxygen installation is recorded on weight and centre-of-gravity schedule. CAUTION: OBSERVE ALL SAFETY PRECAUTIONS.
Colour-coding of controls	Ensure that controls are colour-coded in accordance with the AFM and in good condition.
Placards	Check that the placards are correct and legible, and accurately reflect the status of the aircraft in accordance with the AFM.

ELA2 sailplanes and ELA2 powered sailplanes	
System/component/area	**Task and inspection detail**
LANDING GEAR	
Front skid/nose wheel and mounts	Inspect for evidence of hard/heavy landings. Check skid wear. Inspect wheel, tyre, and wheel box. Check tyre pressure.
Main wheel and brake assembly	Check for integrity of hydraulic seals and leaks in pipework. Check life of hydraulic hoses and components, if specified by the manufacturer. Remove brake drums, check brake lining wear. Check disk/drum wear. Refit drum. Check brake adjustment. CAUTION: BRAKE DUST MAY CONTAIN ASBESTOS. Check operation of brake. Check level of brake fluid and replenish, if necessary. Check tyre pressure. CAUTION: CHECK TYPE OF BRAKE FLUID USED AND OBSERVE SAFETY PRECAUTIONS.
Undercarriage suspension	Check springs, bungees, shock absorbers, and attachments. Check for signs of damage. Service strut, if applicable.
Undercarriage retract system and doors	Check retraction mechanism and controls, warning system if fitted, gas struts, doors and linkages/springs, over-centre/locking device. Perform retraction test.
Tail skid/wheel	Inspect for evidence of hard/heavy landings. Check skid wear. Inspect wheel, tyre, and wheel box. Check bond of bonded skids. Check tyre pressure.
Wheel brake control circuit	Inspect wheel brake control rods/cables. If combined with air brake, ensure correct rigging relationship. Check parking-brake operation, if fitted.
WING AND CENTRE SECTION	
Centre section	Inspect wing centre section including fairings for security, damage, and condition.
Wing attachments	Inspect the structural attachments of the wing. Check for damage, wear, and security. Check for rigging damage. Check condition of wing attachment pins and wing main bolts.
Winglet/wing extensions	Inspect the structural attachments of winglet and wing attachments. Check for damage, wear, and security.
Aileron control circuit/stops	Inspect aileron control rods/cables. Check that control stops are secure and make contact. Inspect connecting control devices for security, damage, free play and secure mounting.
Air brake control circuit	Inspect air brake control rods/cables. Check friction/locking device (if fitted). Inspect connecting control devices for security, damage, free play and secure mounting. Inspect air brake locking for proper adjustment and positive locking.
Wing struts/wires	Inspect struts for damage and internal corrosion. Re-inhibit struts internally every 3 years or in accordance with the manufacturer's instructions.
Wings including underside registration markings	Check mainplane structure externally and internally, as far as possible. Check gel coat, fabric covering, or metal skin.
Ailerons and controls	Inspect aileron and flaperon assemblies, hinges, control connections, springs/bungees, tapes, and seals. Ensure that seals do not impair the full range of movement.
Air brakes/spoilers	Inspect air brake/spoiler panel(s) operating rods, closure springs, and friction devices, as fitted.
Flaps	Check flap system and control. Inspect connecting control devices.

ELA2 sailplanes and ELA2 powered sailplanes	
System/component/area	**Task and inspection detail**
Control deflections and free play, and record them on worksheets	Check and record range of movements and cable tensions, if specified, and check free play.
EMPENNAGE	
Tailplane and elevator	With tailplane de-rigged, check tailplane and attachments, self-connecting and manual control connections. Check gel coat, fabric covering, or metal skin.
Rudder	Check rudder assembly, hinges, attachments, balance weights.
Rudder control circuit/stops	Inspect rudder control rods/cables. Check that control stops are secure and make contact. Pay particular attention to wear and security of liners and cables in 'S' tubes.
Elevator control circuit/stops	Inspect elevator control rods/cables. Check that control stops are secure and make contact. Inspect self-connecting control devices.
Trimmer control circuit	Inspect trimmer control rods/cables. Check friction/locking device. Inspect trim indication for proper adjustment and function.
Control deflections and free play, and record them on worksheets	Check and record range of movements and cable tensions, if specified, and check free play.
AVIONICS AND ELECTRICS	
Electrical installation/fuses	Check all electrical wiring for condition. Check for signs of overheating and poor connections. Check fuses/trips for condition and correct rating.
Battery security and corrosion	Check battery mounting for security and operation of clamp. Check for evidence of electrolyte spillage and corrosion. Check that battery has correct main fuse fitted. It is recommended to carry out battery capacity test on gliders equipped with radio, used for cross-country, controlled airspace, or competition flying.
Radio installations and placards	Check radio installation, microphones, speakers and intercom, if fitted. Check that a call sign placard is installed. Carry out ground function test. Record radio type fitted.
Air speed indicator	Carry out a pitot static leak check and functional check of the airspeed indicator. In case of indications of malfunctions, carry out an airspeed indicator calibration check.
Altimeter datum	Check barometric subscale by altimeter QNH reading.
Pitot-static system	Perform pitot static leak check, inspect hoses for condition, operational check.
Transponder	Perform operational check.
MISCELLANEOUS	
Removable ballast	Check removable ballast mountings and securing devices (including fin ballast, if applicable) for condition. Check that ballast weights are painted with conspicuous colour. Check that provision for the ballast is made on the loading placard.
Drag chute and controls	Inspect chute, packing and release mechanism. Check packing intervals.
Water ballast system	Check water ballast system, wing and tail tanks, as fitted. Check filling points, level indicators, vents, dump and frost drains for operation and leakage. If loose bladders are used, check for leakage and expiry date, as applicable.
POWER PLANT (when applicable) NOTE: In the case of sailplanes with electrical or jet engines, follow the maintenance instructions and recommendations of the DAH.	

ELA2 sailplanes and ELA2 powered sailplanes	
System/component/area	**Task and inspection detail**
Engine pylons and mountings	Inspect engine and pylon installation. Check engine compartment and fire sealing.
Gas strut	Check gas strut.
Pylon/engine stops	Check limit stops on retractable pylons. Check restraint cables.
Electric actuator	Inspect electric actuator, motor, spindle drive, and mountings.
Electrical wiring	Inspect all electrical wiring. Pay special attention to wiring that is subject to bending during extension and retraction of engine/pylon.
Limit switches	Check operation of all limit switches and strike plates. Make sure that they are not damaged by impact.
Fuel tank(s)	Check fuel tank mountings and tank integrity. Check fuel quantity indication system, if fitted.
Fuel pipes and vents	Check all fuel pipes, especially those subject to bending during extension and retraction of engine/pylon. Check that vents are clear. Make sure that overboard drains do not drain into engine compartment. Check self-sealing.
Fuel cock or shut-off valve	Check operation of fuel cock or shut-off valve and indications.
Fuel pumps and filters	Clean or replace filters, as recommended by manufacturer. Check operation of fuel pumps for engine supply or tank replenishment. Check fuel pump controls and indications.
Decompression valve	Inspect decompression valve and operating control.
Ignition	Inspect ignition system including spark plugs, distributor and cables for condition and damage. Inspect low-tension and high-tension wiring, connectors, spark plug caps. Check magneto-to-engine timing.
Propeller	Inspect propeller, hub, folding mechanism, brake, pitch change mechanism, stow sensors. Inspect propeller control for function and condition.
Doors	Check engine compartment doors, operating cables, rods, and cams.
Safety springs	Check all safety and counterbalance springs.
Extension and retraction	Check that extension and retraction operation times are within the limits specified by the manufacturer. Check light indications and interlocks for correct operation.
Exhaust	Inspect exhaust system, silencer, shock mounts, and links.
Engine installation	Inspect engine and all accessories. Carry out compression test and record results (for piston engines). Compression test results: No 1 (left/front); and No 2 (right/rear).
Lubrication	Change engine oil and filter. Replenish oil and additive tanks.
Engine instruments	Inspect all engine instruments and controls. Check control unit, mounts, bonding and connections. Carry out internal self-test, if fitted.
Engine battery	If separate from airframe battery, inspect battery and mountings. If main fuse is fitted, check rating and condition.
Engine battery capacity test	Carry out capacity test. Refer to appropriate manual or guidance.
Placards	Check that all placards are in accordance with the AFM and legible.
Oil and fuel leaks	With the engine fully serviced, check the fuel and oil system for leaks.

MIP for ELA2 hot-air balloons

To be performed at every 100-h/annual interval, whichever comes first.

A tolerance of 1 month or 10 h may be applied. The next interval shall be calculated from the time the inspection takes place.

Note 1: Use the manufacturer's maintenance manual to accomplish each task/inspection.

Note 2: Proper operation of backup or secondary systems and components should be carried out wherever a check for improper installation/operation is performed.

(a) Envelope

System/component/area	Task and inspection detail
Identification (type/serial number/registration plate)	Check for presence.
Crown ring	Inspect for damage/corrosion.
Crown line	Inspect for damage, wear, security of attachment. Check correct length.
Vertical-/horizontal-load tapes	Inspect joints with the crown ring, top of the envelope and wires. Inspect that all load tapes are undamaged along their entire length. Inspect base horizontal tape and edge of the envelope top. Inspect joint between base horizontal-load tape and vertical-load tapes.
Envelope fabric	Inspect the envelope fabric panels (including parachute and rotation vents, if fitted) for damage, porosity overheating or weakness. Unrepaired damage is within tolerance provided for by the manufacturer. If substantial fabric porosity is suspected, a flight test should be performed, but only after a grab test has demonstrated that the balloon is safe to fly. Perform grab test in accordance with the manufacturer's instructions.
Flying cables	Inspect for damage (particularly heat damage).
Karabiners	Inspect for damage/corrosion. Operational check of karabiner lock.
Melting link and 'tempilabel'	Check and record maximum temperature indication (flag/tempilabel).
Control lines and attachments	Inspect for damage wear, security of knots. Check proper length. Check lines attachments for damage, wear, security.
Envelope pulleys/guide rings	Inspect for damage, wear, free running, contamination, security of attachment.

(b) Burner

System/component/area	Task and inspection detail
Identification (type/serial number)	Check for presence and verify type/serial number installed.
Burner frame	Inspect welds for cracking.
	Inspect tubes for distortion/deformation/cuts/gouges.
	Inspect frame for security of fasteners (heat shields, flexi-corners).

System/component/area	Task and inspection detail
	Inspect frame lugs for wear and cracking.
	Inspect general condition (corrosion, heat shields).
Gimballing	Operational check of stiffness and security of fasteners.
Leak check	Perform leak check of the burner.
Fuel hoses including manifolds	Inspect all hoses for wear, damage, leakage and service life limitations. Inspect O-ring seals, lubricate/replace as required.
Pressure gauges	Check that the pressure gauge reads correctly, and that lens is present.
Pilot valves/flame	Check shut-off, free movement, correct function, and lubricate if necessary.
Whisper valves/flame	Check shut-off, free movement, correct function, and lubricate if necessary.
Main valves/flame	Check shut-off, free movement, correct function, and lubricate if necessary.
Coils	Check for damage, distortion, security of fasteners. Inspect welds for cracking. Check security of jets. Tighten or replace, as necessary.

(c) Basket

System/component/area	Task and inspection detail
Identification (type/serial number)	Check for presence.
Basket walls	Check the general condition of the basket walls. Inspect weave for damage, cracks/holes. Check for no sharp objects inside the basket.
Basket wires	Inspect for damage, check swaging and eye rings (thimbles).
Karabiners	Inspect for damage/corrosion. Operational check of karabiner lock.
Basket floor	Inspect for damage and cracks.
Runners	Inspect for damage, security of attachment.
Rawhide	Inspect for damage, wear and attachments to the floor.
Rope handles	Inspect for damage, security of attachment.
Cylinder straps	Inspect for damage, deterioration, approved type fitted.
Padded basket edge trim	Inspect for damage and wear.
Burner support rods	Inspect for damage, wear and cracking.
Padded burner support rod covers	Inspect for damage and wear.
Basket equipment	Check presence and functionality.
Pilot restraint and anchor	Inspect for security and condition.
Fire extinguisher	Check expiration date and protection cover.
First aid kit	Check for completeness and expiration date.

(d) Fuel cylinders

System/component/area	Task and inspection detail
Identification (type/serial number)	Check for presence.
Cylinder	Check if periodic inspections for each cylinder are valid (date) (e.g. 10 years' inspection).
Cylinder body	Inspect for damage, corrosion.

System/component/area	Task and inspection detail
Liquid valve	Inspect for damage, corrosion, correct operation.
	Inspect O-ring seals, lubricate/replace as required.
Fixed liquid Level gauge	Inspect for damage, corrosion, correct operation.
Contents Gauge	Inspect for damage, corrosion, freedom of movement.
Vapour valve	Inspect for damage, corrosion, correct operation (including regulator).
	Check quick-release coupling for correct operation, sealing.
Padded cover	Inspect for damage. Check for correct thickness.
Pressure relief valve	Inspect for contamination, corrosion. Check service life limit.
Assembly	Inspect, and test for leaks all pressure-holding joints using leak detector.
	Perform functional test

(e) Additional equipment

System/component/area	Task and inspection detail
Instruments	Perform functional check.
Quick release	Perform functional check and inspect the condition of the latch, bridle and ropes for wear and deterioration. Check that the karabiners are undamaged and operate correctly.
Communication/navigation equipment (radio)	Perform operational check.
Transponder	Perform operational check.

GM1 ML.A.302(d)(2) Aircraft maintenance programme

OPERATIONAL TEST AND FUNCTIONAL TEST

An operational test (or operational check) is a task used to determine that an item is operating normally. It does not require quantitative tolerances.

A functional test (or functional check) is a quantitative check to determine if one or more functions of an item performs within the limits specified in the appropriate maintenance data. The measured parameter should be recorded.

GM1 ML.A.302(d)(2)(d) Aircraft maintenance programme

OPERATIONAL TEST OF TRANSPONDER

A transponder test that is carried out in accordance with EASA SIB 2011-15 or US Title 14 CFR Part 43 Appendix F is considered to include the MIP task described in ML.A.302(d)(2)(d).

ML.A.303 Airworthiness directives

Any applicable AD must be carried out within the requirements of that AD unless otherwise specified by the Authority.

ML.A.304 Data for modifications and repairs

A person or organisation repairing an aircraft or a component shall assess any damage. Modifications and repairs shall be carried out using, as appropriate, the following data:

(a) approved by the Authority;

(b) approved by a design organisation complying with MCAR-Part-21;

(c) contained in the requirements referred to in point 21.A.90B or point 21.A.431B of MCAR-Part-21.

ML.A.305 Aircraft continuing-airworthiness record system

(a) At the completion of any maintenance, the certificate of release to service (CRS) required by point ML.A.801 shall be entered in the aircraft continuing airworthiness record system. Each entry shall be made as soon as possible but not later than 30 days after the day of the completion of the maintenance task.

(b) The aircraft continuing airworthiness records shall consist of an aircraft logbook, engine logbook(s) or engine module log cards, propeller logbook(s) and log cards, for any service-life-limited component, as appropriate.

(c) The aircraft type and registration mark, the date together with the total flight time and flight cycles and landings, shall be entered in the aircraft logbooks.

(d) The aircraft continuing airworthiness records shall contain:

(1) the current status of ADs and measures mandated by the Authority in immediate reaction to a safety problem;

(2) the current status of modifications, repairs and other DAH maintenance recommendations;

(3) the current status of compliance with the AMP;

(4) the current status of service-life-limited components;

(5) the current mass and balance report;

(6) the current list of deferred maintenance.

(e) In addition to the authorised release document, DCA Form 1, as set out in Appendix II of MCAR-Part-M, or equivalent, the following information relevant to any component installed, such as engine, propeller, engine module or service-life-limited component, shall be entered in the appropriate engine or propeller logbook, engine module or service-life-limited component log card:

(1) the identification of the component;

(2) the type, serial number and registration, as appropriate, of the aircraft, engine, propeller, engine module or service-life-limited component to which the particular component has been fitted, along with the reference to the installation and removal of the component;

(3) the date together with the component's accumulated total flight time, flight cycles, landings and calendar time, as relevant to the particular component;

(4) the current information referred to in point (d), applicable to the component.

(f) The person or organisation responsible for the management of continuing airworthiness and tasks pursuant to point ML.A.201, shall control the records as detailed in point ML.A.305 and present the records to the Authority upon request.

(g) All entries made in the aircraft continuing airworthiness records shall be clear and accurate. When it is necessary to correct an entry, the correction shall be made in a manner that clearly shows the original entry.

(h) An owner shall ensure that a system has been established to keep the following records for the periods specified:

(1) all detailed maintenance records in respect of the aircraft and any service-life-limited component fitted thereto, until such time as the information contained therein is superseded by new information equivalent in scope and detail but no less than 36 months after the aircraft or component has been released to service;

(2) the total time in service, this is to say hours, calendar time, cycles and landings, of the aircraft and all service-life-limited components, for at least 12 months after the aircraft or component has been permanently withdrawn from service;

(3) the time in service, this is to say hours, calendar time, cycles and landings, as appropriate, since the last scheduled maintenance of the component subjected to a service life limit, at least until the component scheduled maintenance has been superseded by another scheduled maintenance of equivalent work scope and detail;

(4) the current status of compliance with the AMP at least until the scheduled maintenance of the aircraft or component has been

superseded by another scheduled maintenance of equivalent work scope and detail;

(5) the current status of ADs applicable to the aircraft and components, at least 12 months after the aircraft or component has been permanently withdrawn from service;

(6) details of current modifications and repairs to the aircraft, engine(s), propeller(s) and any other component vital to flight safety, at least 12 months after they have been permanently withdrawn from service.

AMC1 ML.A.305 Aircraft continuing-airworthiness record system

(a) Any other forms different from a logbook/log card of keeping the below information could be acceptable. For example, that could be in paper form, a spreadsheet or an IT system.

(b) A log card and status for components other than propeller and engines could be combined in a single document.

(c) If the AD is generally applicable to the aircraft or component type but is not applicable to the particular aircraft, engine, propeller or component, then this should be identified as well as the reason why it is not applicable. There is no need to list those ADs that are superseded or cancelled.

(d) The current status of ADs should be sufficiently detailed to identify the complied AD and/or the due limit.

(e) If the IT system is the only record-keeping system, it should have at least one backup system, which should be regularly updated. Each terminal should contain programme safeguards against the probability of unauthorised personnel altering the database.

ML.A.307 Transfer of aircraft continuing-airworthiness records

(a) When an aircraft is permanently transferred from one owner to another, the transferring owner shall ensure that the continuing airworthiness records referred to in point ML.A.305 are also transferred.

(b) When the owner contracts the continuing airworthiness management tasks to a CAMO or CAO the owner shall ensure that the continuing airworthiness records referred to in point ML.A.305 are transferred to the contracted organisation.

(c) The time periods for the retention of records set out in point (h) of point ML.A.305 shall continue to apply to the new owner, CAMO or CAO.

SUBPART D — MAINTENANCE STANDARDS

ML.A.401 Maintenance data

(a) The person or organisation maintaining an aircraft shall only use applicable maintenance data during the performance of maintenance.

(b) For the purposes of Part-ML to this MCAR, "applicable maintenance data" means any of the following:

1. any applicable requirement, procedure, standard or information issued by the Authority;

2. any applicable AD;

3. the applicable ICA and other maintenance instructions, issued by the type-certificate holder, supplementary type-certificate holder and any other organisation that publishes such data in accordance with MCAR-Part-21;

4. for components approved for installation by the design approval holder, the applicable maintenance instructions published by the component manufacturers and acceptable to the design approval holder;

5. any applicable data issued in accordance with point 145.A.45(d) of MCAR-Part-145.

GM1 ML.A.401(b) Maintenance data

Similar provisions to those in GM1 M.A.401(b)(3) and (b)(4) and GM1 M.A.401(b)(4) apply.

ML.A.402 Performance of maintenance

(a) Maintenance performed by approved maintenance organisations shall be in accordance with Subpart F of MCAR-Part-M, MCAR-Part-145 or MCAR-Part-CAO, as applicable.

(b) For maintenance not performed in accordance with point (a), the person performing maintenance shall:

(1) be qualified for the tasks performed, as required by this Part-ML;

(2) ensure that the area in which maintenance is carried out is well organised and clean with no dirt or contamination;

(3) use the methods, techniques, standards and instructions specified in the maintenance data referred to in point ML.A.401;

(4) use the tools, equipment and material specified in the maintenance data referred to in point ML.A.401. If necessary, tools and equipment shall be controlled and calibrated to an officially recognised standard;

(5) ensure that maintenance is performed within any environmental limitations specified in the maintenance data referred to in point ML.A.401;

(6) ensure that proper facilities are used in case of inclement weather or lengthy maintenance;

(7) ensure that the risk of multiple errors during maintenance and the risk of errors being repeated in identical maintenance tasks are minimised;

(8) ensure that an error-capturing method is implemented after the performance of any critical maintenance task;

(9) perform a general verification after completion of maintenance to ensure that the aircraft or component is clear of all tools, equipment and any extraneous parts and material, and that all access panels removed have been refitted;

(10) ensure that all maintenance performed is properly recorded and documented.

AMC1 ML.A.402 Performance of maintenance

(a) Examples of acceptable methods to record and document the maintenance performed are the following:

- a copy of the 100-h/annual inspection checklist with ticks and signature; and
- a copy of the release to service indicating the tasks performed.

(b) Airborne contamination (e.g. dust, precipitation, paint particles, filings) should be kept to a minimum to ensure aircraft/components surfaces are not contaminated. If this is not possible, all susceptible systems should be sealed until acceptable conditions are re-established.

AMC1 ML.A.402(b)(7) Performance of maintenance

To minimise the risk of errors and to prevent omissions, the person performing maintenance should ensure that:

(a) every maintenance task is signed off only after completion;

(b) the grouping of tasks for the purpose of sign-off allows critical steps to be clearly identified; and

(c) any work performed by personnel under supervision (i.e. temporary staff, trainees) is checked and signed off by an authorised person.

AMC1 ML.A.402(b)(8) Performance of maintenance

CRITICAL MAINTENANCE TASKS

The following maintenance tasks should primarily be reviewed to assess their impact on safety:

(a) tasks that may affect the control of the aircraft's flight path and attitude, such as the installation, rigging and adjustments of flight controls;

(b) tasks that may affect aircraft stability control systems (autopilots, fuel transfer);

(c) tasks that may affect the propulsive force of the aircraft, including the installation of aircraft engines, propellers and rotors; and

(d) the overhaul, calibration or rigging of engines, propellers, transmissions and gearboxes.

AMC2 ML.A.402(b)(8) Performance of maintenance

ERROR-CAPTURING METHODS

Re-inspection, when only one person is available to carry out the task, or independent inspection, are possible error-capturing methods.

ML.A.403 Aircraft defects

(a) Any aircraft defect that seriously endangers the flight safety shall be rectified before further flight.

(b) The following persons may decide that a defect does not seriously endanger flight safety, and may defer it accordingly:

(1) the pilot in respect of defects affecting non-required aircraft equipment;

(2) the pilot, when using the minimum equipment list, in respect of defects affecting required aircraft equipment — otherwise, these defects may only be deferred by authorised certifying staff;

(3) the pilot in respect of defects other than those referred to in points (b)(1) and (b)(2) if all the following conditions are met:

(i) the aircraft is operated under MCAR-Part-NCO or, in the case of balloons or sailplanes, not operated under Subpart-ADD of Part-BOP to this MCAR or not following Subpart DEC of Part-SAO of MCAR-Sailplanes;

(ii) the pilot defers the defect with the agreement of the aircraft owner or, if applicable, of the contracted CAMO or CAO;

(4) the appropriately qualified certifying staff in respect of other defects than those referred to in points (b)(1) and (b)(2), where the conditions referred to in point 3(i) and (ii) are not met.

(c) Any aircraft defect that does not seriously hazard flight safety shall be rectified as soon as practicable from the date on which the defect was first identified and within the limits specified in the maintenance data.

(d) Any defect not rectified before flight shall be recorded in the aircraft continuing airworthiness record system referred to in point ML.A.305 and a record shall be available to the pilot.

AMC1 ML.A.403 Aircraft defects

Aircraft equipment should be declared to be defective if the pilot observed a malfunction during the flight, or if considered as faulty after inspection/test referred to in the maintenance data. This does not prevent the pilot from recording observations and comments on the performance of the aircraft equipment where this is not considered to constitute a defect.

GM1 ML.A.403 Aircraft defects

If appropriate certifying staff is readily available for consultation, the pilot should consider consultation with them before deferring any defect.

For balloons not operated under Subpart-ADD, sailplanes not operated under Subpart DEC of Part-SAO of MCAR-Sailplanes, or other aircraft operated under MCAR-Part-NCO, the pilot may defer required equipment, regardless of whether or not a CAMO or CAO is contracted. However, if doing so, he or she has the obligation to receive the agreement of the owner, or the contracted CAMO or CAO.

The term ‘required’ refers to equipment that is required by the applicable airworthiness code (certification specification) or required by the relevant regulations for air operations or the applicable rules of the air or as required by air traffic management (e.g. a transponder in certain controlled airspace).

AMC1 ML.A.403(d) Aircraft defects

All deferred defects should be made known to the pilot/flight crew, whenever possible, prior to their arrival at the aircraft.

Deferred defects should be listed on the current list of deferred maintenance (ML.A.305(d)(6)) and rectified at the next appropriate maintenance event and within the limit specified in the maintenance data. Any deferred defect that is not rectified

during the next maintenance event, should be re-entered on the list of deferred maintenance and the original date of the defect should be retained.

SUBPART E — COMPONENTS

ML.A.501 Classification and installation

(a) Unless otherwise specified in Subpart F of MCAR-Part-M, in MCAR-Part-145, in MCAR-Part-CAO or in point 21.A.307 of MCAR-Part-21, a component may be fitted only if all of the following conditions are met:

(i) it is in a satisfactory condition;

(ii) it has been appropriately released to service using a DCA Form 1 as set out in Appendix II to MCAR-Part-M, or equivalent;

(iii) it has been marked in accordance with Subpart Q of MCAR-Part-21.

(b) Prior to the installation of a component on an aircraft, the person or approved maintenance organisation shall ensure that the particular component is eligible to be fitted if different modifications or AD configurations are applicable.

(c) Standard parts shall only be fitted to an aircraft or component when the maintenance data specifies those particular standard parts. Standard parts shall only be fitted when accompanied by evidence of conformity to the applicable standard and has appropriate traceability.

(d) Raw or consumable material shall only be used on an aircraft or component provided that:

(i) the aircraft or component manufacturer allows for the use of raw or consumable material in relevant maintenance data or as specified in Subpart F of MCAR-Part-M, MCAR-Part-145 or MCAR-Part-CAO.

(ii) such material meets the required material specification and has appropriate traceability.

(iii) such material is accompanied by documentation clearly relating to the particular material and containing a conformity-to-specification statement as well as the manufacturing and supplier source.

(e) In case of balloons, where different combinations of baskets, burners and fuel cylinders are possible for a particular envelope, the person installing them shall ensure that:

(1) the basket, burner and/or fuel cylinders are eligible for installation according to the TCDS or other documents referred to in the TCDS;

(2) the basket, burner and/or fuel cylinders are in serviceable condition and have the appropriate maintenance records.

GM1 ML.A.501(a) Classification and installation

Point (b) of 21.A.307 specifies new components that do not need a DCA Form 1 or equivalent to be eligible for installation. Point (c) of 21.A.307 specifies the conditions for the document accompanying the component.

AMC1 ML.A.501(a)(ii) Classification and installation

DCA FORM 1 OR EQUIVALENT

A document equivalent to a DCA Form 1 may be:

(a) a release document issued by an organisation under the terms of a bilateral agreement signed by the European Union;

(b) a release document issued by an organisation approved under the terms of a JAA bilateral agreement until superseded by the corresponding agreement signed by the European Union;

(c) a JAA Form One issued prior to 28 November 2004 by a JAR 145 organisation approved by a JAA Full Member State;

(d) in the case of new aircraft components that were released from manufacturing prior to the MCAR-Part-21 compliance date, a JAA Form One issued by a JAR 21 organisation approved by a JAA Full Member State within the JAA mutual recognition system;

(e) a JAA Form One issued prior to 28 September 2005 by a production organisation approved by a competent authority in accordance with its national regulations;

(f) a JAA Form One issued prior to 28 September 2008 by a maintenance organisation approved by a competent authority in accordance with its national regulations;

(g) a release document acceptable to a competent authority according to the provisions of a bilateral agreement between the competent authority and a third country until superseded by the corresponding agreement signed by the European Union;

(h) a release document issued under the conditions described in points M.A.801 and M.A.802 MCAR-Part-M; and

(i) a ‘declaration of maintenance accomplished’ issued by the person or organisation that performed the maintenance, as specified in point ML.A.502(c).

AMC1 ML.A.501(e) Classification and installation

BALLOONS

Baskets, burners and fuel cylinders are components which are often interchanged between different balloons. Furthermore, they are often removed/installed by the pilot-owner (or by other persons when such removal/installation is not considered maintenance because the task is described in the AFM).

As a consequence, a DCA Form 1 does not need to be issued when these components are removed in serviceable condition from a balloon, and can be installed on another balloon as long as the person performing the installation has access to the appropriate maintenance records necessary to establish their serviceable condition. In particular, due attention should be paid to the inspection dates of the various components.

This does not supersede the requirement to release any maintenance performed on such components either on a DCA Form 1 or equivalent or on the balloon maintenance log book, as applicable.

ML.A.502 Component maintenance

(a) Components which are accepted by the owner in accordance with point (b)(2) of point 21.A.307 of MCAR-Part-21 shall be maintained by any person or organisation, subject to reacceptance by the owner under the conditions of point (b)(2) of point 21.A.307 of that MCAR. This maintenance is not eligible for the issuance of a DCA Form 1, as set out in Appendix II to MCAR-Part-M, and shall be subject to the aircraft release requirements.

(b) Components shall be released in accordance with the following table:

	Released using a DCA Form 1 (as set out in Appendix II of MCAR-Part-M)	Released at aircraft level per point ML.A.801 (not possible to issue a DCA Form 1)
Components maintained in accordance with component maintenance data (data issued by the component manufacturer)		
Maintenance other than overhaul	Engine-rated (for engine) or component-rated (for other components) maintenance organisations	(i) Aircraft-rated maintenance organisations; and/or (ii) independent certifying staff
Overhaul of components other than engines and propellers	Component-rated maintenance organisations	Not possible
Overhaul of engines and propellers for CS-VLA, CS-22 and LSA aircraft	Engine-rated (for engine) or component-rated (for propeller) maintenance organisations	(iii) Aircraft-rated maintenance organisations; and/or (iv) independent certifying staff
Overhaul of engines and propellers for other than	Engine-rated (for engine) or component-rated (for	Not possible

CS-VLA, CS-22 and LSA aircraft	propeller) maintenance organisations	
Components maintained in accordance with aircraft maintenance data (data issued by the aircraft manufacturer)		
All components and all types of maintenance	Engine-rated (for engine) or component-rated (for other components) maintenance organisations	– Aircraft-rated maintenance organisations; and/or – independent certifying staff

(c) Components which are referred to in points (b)(3) to (b)(6) of point 21.A.307 of MCAR-Part-21 may be maintained by any person or organisation. In such case, by way of derogation from point (b), the maintenance of those components shall be released with a "declaration of maintenance accomplished" issued by the person or organisation that performed the maintenance. The "declaration of maintenance accomplished" shall contain at least basic details of the maintenance carried out, the date on which the maintenance was completed, and the identification of the organisation or person that issues it. It shall be considered a maintenance record and equivalent to a DCA Form 1 in respect of the maintained component.

GM1 ML.A.502 Component maintenance

COMPONENT MAINTENANCE BY INDEPENDENT CERTIFYING STAFF

The cases where the independent certifying staff can release component maintenance are only valid when the independent certifying staff is allowed, according to ML.A.201, to carry out maintenance (refer to GM1 ML.A.201) and when he or she is competent for such component maintenance.

As an example, in accordance with ML.A.201(e), the independent certifying staff cannot carry out maintenance when the balloon is operated under Subpart-ADD.

GM1 ML.A.502(c) Component maintenance

A 'declaration of maintenance accomplished' is a certificate prepared in any shape/form by the person or organisation that performed any maintenance on the component covered by the certificate and subject to conditions in ML.A.502(c). This person or organisation does not need an approval to perform maintenance in accordance with MCAR-Part-M. In order for the component to be eligible for installation with a 'declaration of maintenance accomplished', this declaration, together with other records, should allow the determination that the component was first installed as 'new', as a component referred to in ML.A.502(c). Such a component should not be installed in an aircraft if there is information on the certificate which is not readable or not understandable or states that the component is not in a satisfactory condition for operation.

ML.A.503 Service-life-limited components

(a) The term 'service life-limited components' contains the following components:

(1) components subject to a certified life limit after which the components should be retired, and;

(2) components subject to a service life limit after which the components shall undergo maintenance to restore their serviceability.

(b) Installed service-life-limited components shall not exceed the approved service life limit as specified in the AMP and ADs, except as provided for in point ML.A.504(c).

(c) The approved service life is expressed in calendar time, flight hours, landings or cycles, as appropriate.

(d) At the end of the approved service life limit, the component must be removed from the aircraft for maintenance, or for disposal in the case of components with a certified life limit.

ML.A.504 Control of unserviceable components

(a) A component shall be considered unserviceable in any of the following circumstances:

(1) expiry of the component's service life limit as defined in the AMP;

(2) non-compliance with the applicable ADs and other continued-airworthiness requirement mandated by the Authority;

(3) absence of the necessary information to determine the airworthiness status of the component or its eligibility for installation;

(4) evidence of component defects or malfunctions;

(5) component involvement in an incident or accident likely to affect its serviceability.

(b) Unserviceable components shall be identified as one of the following:

(1) unserviceable and stored in a secure location under the control of an approved maintenance organisation or independent certifying staff until a decision is made on the future status of such components;

(2) unserviceable by the person or organisation that declared the component unserviceable, and its custody shall be transferred to the aircraft owner after documenting such transfer in aircraft maintenance record system referred to in point ML.A.305.

(c) Components which have reached their certified life limit or contain a non-repairable defect or malfunction shall be classified as unsalvageable and shall not be permitted to re-enter the component supply system unless certified life limits have been extended or a repair solution has been approved in accordance with point ML.A.304.

(d) Any person or organisation responsible pursuant to point ML.A.201 shall in the case of an unsalvageable component, as provided for in point (c), take one of the following actions:

(1) retain such component in a location referred to in point (b)(1);

(2) arrange for the component to be mutilated in a manner that ensures that it is beyond economic salvage or repair before relinquishing responsibility for such a component.

(e) Notwithstanding point (d), a person or organisation responsible pursuant to point ML.A.201 may transfer responsibility of components classified as unsalvageable without mutilation to an organisation for training or research.

SUBPART H — CERTIFICATE OF RELEASE TO SERVICE (CRS)

ML.A.801 Aircraft certificate of release to service

(a) A CRS shall be issued after the required maintenance has been carried out properly on an aircraft.

(b) The CRS shall be issued, alternatively by:

(1) appropriate certifying staff on behalf of the approved maintenance organisation;

(2) independent certifying staff;

(3) the pilot- owner in compliance with point ML.A.803.

(c) By derogation from point (b), in the case of unforeseen circumstances, when an aircraft is grounded at a location where no appropriately approved maintenance organisation and no appropriate certifying staff are available, the owner may authorise any person, with no less than 3 years of appropriate maintenance experience and holding the proper qualifications, to maintain the aircraft according to the standards set out in Subpart D of this Part-ML and release the aircraft. The owner shall in that case:

(1) obtain and keep in the aircraft records, details of all the work carried out and of the qualifications held by the person issuing the certification;

(2) ensure that any such maintenance is rechecked and released in accordance with point (b) of point ML.A.801 at the earliest opportunity and within a period not exceeding 7 days or, in the case of aircraft operated under MCAR-Part-NCO or, in the case of balloons, not operated under Subpart-ADD of Part-BOP to this MCAR or, in the case of sailplanes not following Subpart DEC of MCAR-Part-SAO, within a period not exceeding 30 days;

(3) notify the contracted CAMO or CAO, or the Authority in the absence of such a contract, within 7 days of the issuance of such authorisation.

(d) In the case of a release to service in accordance with points (b)(1) or (b)(2), the certifying staff may be assisted in performing the maintenance tasks by one or more persons subject to his direct and continuous control;

(e) A CRS shall contain at least:

(1) basic details of the maintenance carried out;

(2) the date on which the maintenance was completed;

(3) the identity of the organisation or person issuing the release to service, including, alternatively:

(i) the approval reference of the maintenance organisation and certifying staff issuing the CRS;

(ii) in the case of point (b)(2), the identity and, if applicable, the licence number of the independent certifying staff issuing the CRS;

(4) the limitations to airworthiness or operations, if any.

(f) By derogation from point (a) and notwithstanding point (g), when the required maintenance cannot be completed, a CRS may be issued within the approved aircraft limitations. In that case, the CRS shall indicate that the maintenance could not be completed, as well as indicate any applicable airworthiness or operations limitations, as part of the information required in point (e)(4).

(g) A CRS shall not be issued in the case of any known non-compliance with the requirements of this Part-ML which endangers flight safety.

AMC1 ML.A.801 Aircraft certificate of release to service

AIRCRAFT CERTIFICATE OF RELEASE TO SERVICE (CRS) AFTER EMBODIMENT OF A STANDARD CHANGE OR A STANDARD REPAIR (SC/SR)

1. Release to service and eligible persons

Only natural or legal persons entitled to release to service an aircraft after maintenance (see ML.A.801(b)) are considered as an eligible installer responsible for the embodiment of a SC/SR when in compliance with applicable requirements.

Since the design of the SC/SR does not require specific approval, the natural or legal person releasing the embodiment of the change or repair takes the responsibility that the applicable certification specifications within CS-STAN are fulfilled while being in compliance with Part-ML/ Part-M Subpart F/Part-CAO and/or Part-145 and not in conflict with the TC holder's data. This includes responsibility in respect of an adequate design, the selection/manufacturing of suitable parts and their identification, documenting the change or repair, generation or amendment of aircraft manuals and instructions as needed, embodiment of the change/repair, releasing the aircraft to service and record-keeping.

Depending on its nature, for certain SCs/SRs, CS-STAN might restrict the eligibility for the issuance of the release to service to certain persons (e.g. standard change/repair not suitable for release to service by the pilot-owner).

2. Parts and appliances to be installed as part of a SC/SR

The design of the parts and appliances to be used in a SC/SR is considered a part of the change/repair, and, therefore, there is no need of a specific design approval. However, it is possible that for a particular SC, these certification

specifications specifically require the use of parts and appliances that meet a technical standard. In this case, when the parts and appliances are required to be authorised as an ETSO article, other articles recognised as equivalent by means of an international safety agreement or grandfathered in accordance with MCAR-Part-21 are equally acceptable.

Normally, a SC/SR shall not contain specifically designed parts that should be produced by a production organisation approved in accordance with MCAR-Part-21 (POA). However, in the case that the change or repair would contain such a part, it should be produced by an approved production organisation (POA holder), and delivered with a DCA Form 1. An arrangement in accordance with 21.A.122(b) is not applicable.

Eligibility for installation of parts and appliances belonging to a SC/SR is subject to compliance with the MCAR-Part-21 and MCAR-Part-ML and maintenance-organisation-related provisions, and the situation varies depending on the aircraft in/on which the SC/SR is to be embodied, and who the installer is. The need for a DCA Form 1 is addressed in MCAR-Part-21 and MCAR-Part-ML, while less restrictive rules may, for instance, apply for ELA1 and ELA2 aircraft parts (e.g. 21.A.307) and sailplane parts (e.g. AMC 21.A.303 of the 'AMC and GM to MCAR-Part-21'). Furthermore, MCAR-Part-M Subpart F, MCAR-Part-CAO and MCAR-Part-145 contain provisions (i.e. M.A.603(c), CAO.A.020(c) and 145.A.42(c)) that allow maintenance organisations to fabricate certain parts to be installed in/on the aircraft as part of their maintenance activities.

3. Parts' and appliances' identification

The parts modified or installed during the embodiment of the SC/SR need to be permanently marked in accordance with MCAR-Part-21 Subpart Q.

4. Documenting the SC/SR and declaring compliance with the certification specifications

In accordance with MCAR-Part-ML, MCAR-Part-M Subpart F, MCAR-Part-MCAR-CAO or MCAR-Part-145 (e.g. ML.A.801(e), M.A.612, CAO.A.065 and 145.A.50(b)), the legal or natural person responsible for the embodiment of a change or a repair should compile details of the work accomplished. In the case of SCs/SRs, this includes, as necessary, based on the complexity, an engineering file containing drawings, a list of the parts and appliances used for the change or repair, supporting analysis and the results of tests performed or any other evidence suitable to show that the design fulfils the applicable certification specifications within CS-STAN together with a statement of compliance and amendments to aircraft manuals, to instructions for continuing airworthiness and to other documents such as aircraft parts list, wiring diagrams, etc. as deemed necessary. The DCA Form 123 is prepared for the purpose of documenting the preparation and embodiment of the SC/SR. The aircraft logbook should contain an entry referring to DCA Form 123; both DCA Form 123 and the release to service required after the embodiment of the SC/SR should be signed by the same person.

DCA Form 123 and all the records listed on it should follow elementary principles of controlled documentation, e.g. contain reference number of documents, issue dates, revision numbers, name of persons preparing/releasing the document, etc.

5. Record-keeping

The legal or natural person responsible (see paragraph 1. above) for the embodiment of the change/repair should keep the records generated with the SC/SR as required by MCAR-Part-ML, MCAR-Part-M Subpart F, MCAR-Part-CAO or MCAR-Part-145 and CS-STAN.

In addition, ML.A.305 requires that the aircraft owner (or CAMO or CAO, if a contract in accordance with ML.A.201 exists) keeps the status of the changes/repairs embodied in/on the aircraft in order to control the aircraft configuration and manage its continuing airworthiness.

With regard to SCs/SRs, the information provided to the owner, CAMO or CAO may be listed in DCA Form 123 and should include, as required, a copy of any modified aircraft manual and/or instructions for continuing airworthiness. All this information should normally be consulted when the aircraft undergoes an AR, and, therefore, a clear system to record the embodiment of SCs/SRs, which is also easily traceable, would be of help during subsequent aircraft inspections.

6. Instructions for continuing airworthiness (ICA)

As stipulated in ML.A.302, the aircraft owner, CAMO or CAO needs to assess if the changes in the ICA of the aircraft require the amendment of the AMP.

7. Embodiment of more than one SC

The embodiment of two or more related SCs described in Subpart B of CS-STAN is permitted as a single change (the use of one DCA Form 123 only) as long as adequate references to and records of all SCs embodied are captured. Restrictions and limitations of the two (or more) SCs would apply. It is permitted to issue a single release to service containing adequate traceability of all the SCs embodied.

8. Acceptable form to be used to record the embodiment of SCs/SRs

See DCA Form 123.

DCA Form 123 — Standard Change/Standard Repair (SC/SR) embodiment record

DCA Form 123 — Standard Change/Standard Repair (SC/SR) embodiment record	1. SC/SR number(s):
2. SC/SR title & description:	
3. Applicability:	
4. List of parts (description/Part-No/Qty):	

5. Operational limitations/affected aircraft manuals. Copies of these manuals are provided to the aircraft owner:
6. Documents used for the development and embodiment of this SC/SR: * Copies of the documents marked with an asterisk are handed to the aircraft owner.
7. Instructions for continuing airworthiness. Copies of these manuals are provided to the aircraft owner:
8. Other information:
9a. ☐ This SC complies with the criteria established in 21.A.90B(a) and with the relevant paragraphs of CS-STAN.
9b. ☐ This SR complies with the criteria established in 21.A.431B(a) and with the relevant paragraphs of CS-STAN.

10. Date of SC/SR embodiment:	11. Identification data and signature of the person responsible for the embodiment of the SC/SR:

12. Signature of the aircraft owner. This signature attests that all relevant documentation is handed over from the issuer of this form to the aircraft owner, and, therefore, the latter becomes aware of any impact or limitations on operations or additional continuing airworthiness requirements which may apply to the aircraft due to the embodiment of the change/repair.

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Notes:

Original remains with the legal or natural person responsible for the embodiment of the SC/SR.

The aircraft owner should retain a copy of this form.

The aircraft owner should be provided with copies of the documents referenced in boxes 5 and 7 and those in box 6 marked with an asterisk '*'.

he 'relevant paragraphs' in boxes 9a and 9b refer to the applicable paragraphs of 'Subpart A – General' of CS-STAN and those of the SC/SR quoted in box 2.

For box 12, when the aircraft owner has signed a contract in accordance with ML.A.201, it is possible that the CAMO or CAO representative signs box 12 and provides all relevant information to the owner before next flight.

Completion instructions:

Use English or the official language of the State of registry to fill in the form.

1. Identify the SC/SR with a unique number and reference this number in the aircraft logbook.

2. Specify the applicable DCA CS-STAN chapter including revision (e.g. CS-SCxxxy or CS-SRxxxy) & title. Provide also a short description.

3. Identify the aircraft (a/c) registration, serial number and type.

4. List the parts' numbers and description for the parts installed. Refer to an auxiliary document if necessary.

5. Identify affected aircraft manuals.

6. Refer to the documentation developed to support the SC/SR and its embodiment, including design data required by CS-STAN: design definition, documents recording the showing of compliance with the certification specifications or any test result, etc. The documents' references should quote their revision/issue.

7. Identify instructions for continuing airworthiness that need to be considered for the aircraft maintenance programme review.

8. To be used as deemed necessary by the installer.

9a., 9b., 10. and 12. Self-explanatory.

11. Give full name details and certificate reference (of the natural or legal person) used for issuing the aircraft release to service.

AMC1 ML.A.801(e) Aircraft certificate of release to service

(a) The aircraft CRS should contain one of the following statements:

(1) 'certifies that the work specified, except as otherwise specified, was carried out in accordance with MCAR-Part-ML, and in respect to that work, the aircraft is considered ready for release to service.'; or

(2) for a pilot-owner:

'certifies that the limited pilot-owner maintenance specified, except as otherwise specified, was carried out in accordance with MCAR-Part-ML, and in respect to that work, the aircraft is considered ready for release to service.'.

(b) The CRS should relate to the task specified in the DAH's or operator's instruction or the AMP which itself may cross-refer to a DAH's/operator's instruction in a maintenance manual, service bulletin, etc. This should indicate the revision status of the maintenance instruction used.

(c) The CRS should include the date when the maintenance took place relative to any life or overhaul limitation in terms of date/flying hours/cycles/ landings etc. as appropriate.

(d) When extensive maintenance has been carried out, it is acceptable for the CRS to summarise the maintenance as long as there is a unique cross reference to the work pack containing full details of the maintenance carried out. Dimensional information should be retained in the work pack record.

(e) The person issuing the CRS should use his or her normal signature except in the case where a computer release-to-service system is used. In this latter case, the Authority needs to be satisfied that only this particular person may electronically issue the CRS. One such method of compliance is the use of a magnetic or optical personal card in conjunction with a personal identification number (PIN) known only to the individual, which is keyed into the computer. A certification stamp is optional.

(f) At the completion of all maintenance, owners, certifying staff, operators and maintenance organisations should ensure they have a clear, concise and legible record of the work performed.

(g) In the case of an ML.A.801(b)(2) CRS, the independent certifying staff should retain all records necessary to prove that all requirements have been met for the issuance of a CRS.

AMC1 ML.A.801(f) Aircraft certificate of release to service

Certain maintenance data issued by the DAH (e.g. AMM) requires that a maintenance task be performed in flight as a necessary condition to complete the maintenance ordered. Within the aircraft limitations, the person authorised to certify the maintenance per ML.A.801 should release the incomplete maintenance before this flight. GM1 ML.A.301(f) describes the relations with the aircraft operator, which retains the responsibility for the MCF. After performing the flight and any additional maintenance necessary to complete the maintenance ordered, a CRS should be issued in accordance with ML.A.801.

ML.A.802 Component certificate of release to service

(a) Except for the cases covered by point (c) of point ML.A.502, a component CRS shall be issued after the required maintenance work has been properly carried out on an aircraft component in accordance with point ML.A.502.

(b) The authorised release certificate identified as DCA Form 1, as set out Appendix II of MCAR-Part-M, constitutes the component CRS, except when such maintenance is released at aircraft level, as indicated in point ML.A.502(b).

ML.A.803 Pilot-owner authorisation

(a) To qualify as a pilot-owner, the person must:

(1) hold a valid pilot licence or equivalent licence issued or validated by the State for the aircraft type or class rating;

(2) own the aircraft, either as a sole or joint owner; that owner must be, alternatively:

(i) one of the natural persons on the registration form;

(ii) a member of a non-profit recreational legal entity, where the legal entity is specified on the registration document as owner or operator; that member must be directly involved in the decision-making process of the legal entity and designated by that legal entity to carry out Pilot-owner maintenance.

(b) For aircraft operated under MCAR-Part-NCO or, in the case of balloons, not operated under Subpart-ADD of Part-BOP to this MCAR or, in the case of sailplanes, not following Subpart DEC of MCAR-Part-SAO, the pilot-owner may issue a CRS after limited Pilot-owner maintenance as provided for in Appendix II to this Part-ML.

(c) The CRS shall be entered in the logbooks and contain basic details of the maintenance carried out, the maintenance data used, the date on which that maintenance was completed, as well as the identity, the signature and the pilot licence (or equivalent) number of the pilot-owner issuing such a certificate.

AMC1 ML.A.803 Pilot-owner authorisation

(a) A pilot-owner may only issue a CRS for the maintenance he or she has performed (ref. ML.A.201(c), ML.A.801 and ML.A.803).

(b) In the case of jointly-owned aircraft, the AMP should list the names of all pilot-owners that are competent and designated to perform pilot-owner maintenance (ref. ML.A.302(c)(6)). As an alternative, the AMP may contain a procedure to ensure how such a list should be managed and kept current.

(c) An equivalent valid pilot-owner licence may be any document attesting a pilot qualification recognised by the State.

(d) Not holding a valid medical examination does not invalidate the pilot licence (or equivalent) required under ML.A.803(a)(1) for the purpose of the pilot-owner authorisation.

SUBPART I — AIRWORTHINESS REVIEW CERTIFICATE (ARC)

ML.A.901 Aircraft airworthiness review

To ensure the validity of the aircraft airworthiness certificate, an airworthiness review of the aircraft and its continuing airworthiness records shall be carried out periodically.

(a) An ARC is issued in accordance with Appendix IV (DCA Form 15c) to this Part-ML upon completion of a satisfactory airworthiness review. The ARC shall be valid for 1 year;

(b) The airworthiness review and the issuance of the ARC shall be performed in accordance with point ML.A.903, alternatively by:

(1) the Authority;

(2) an appropriately approved CAMO or CAO;

(3) the approved maintenance organisation while performing the 100-h/annual inspection contained in the AMP;

(4) for aircraft operated under MCAR-Part-NCO or, in the case of balloons, not operated under Subpart-ADD of Part-BOP to this MCAR or, in the case of sailplanes, not following Subpart DEC of Part-SAO of MCAR-Sailplanes, the independent certifying staff while performing the 100-h/annual inspection contained in the AMP, when holding:

(i) a licence issued in accordance with MCAR-Part-66 rated for the corresponding aircraft or, if MCAR-Part-66 is not applicable to the particular aircraft, a national certifying-staff qualification valid for that aircraft;

(ii) an authorisation issued by, alternatively:

(A) the Authority who issued the licence issued in accordance with MCAR-Part-66,

(B) if MCAR-Part-66 is not applicable, the Authority responsible for the national certifying-staff qualification.

Independent certifying staff holding a licence issued in accordance with MCAR-Part-66, may perform airworthiness reviews and issue the ARC for aircraft registered in Mauritius. However, independent certifying staff holding a national qualification shall only perform airworthiness reviews and issue the ARC for aircraft registered in Mauritius if authorised by the Authority.

Whenever circumstances reveal the existence of a potential safety threat, the Authority shall carry out the airworthiness review and issue the ARC itself.

(c) The validity of an ARC may be extended maximum two consecutive times, for a period of one year each time, by an appropriately approved CAMO or CAO, subject to the following conditions:

(1) the aircraft has been continuously managed for the previous 12 months by this CAMO or CAO;

(2) the aircraft has been maintained for the previous 12 months by approved maintenance organisations; this includes pilot-owner maintenance tasks carried out and released to service either by the pilot-owner or by independent certifying staff;

(3) the CAMO or CAO does not have any evidence or reason to believe that the aircraft is not airworthy.

This extension by the CAMO or CAO is possible regardless of which staff or organisation, as provided for in point (b), initially issued the ARC.

(d) By derogation from point (c), the extension of the ARC may be anticipated for a maximum period of 30 days, without loss of continuity of the airworthiness review pattern, to ensure the availability of the aircraft in order to place the original ARC on board.

(e) When the Authority carries out the airworthiness review and issues the ARC itself, the owner shall provide the Authority with:

(1) the documentation required by the Authority;

(2) suitable accommodation at the appropriate location for its personnel;

(3) when necessary, the support of appropriate certifying staff.

GM1 ML.A.901 Aircraft airworthiness review

If a CAMO/CAO holding the AR privilege is contracted by the owner, this organisation does not have the obligation to carry out the AR itself. The owner may select another CAMO or CAO to carry out the AR, or request the maintenance organisation to carry it out and issue the ARC in conjunction with the annual inspection.

Please refer to GM1 ML.A.201 to identify the cases where the owner may also request an independent certifying staff (authorised by the Authority) to carry out the AR and issue the ARC in conjunction with the annual inspection.

Point ML.A.901(b) gives a list of the different organisations or persons that are allowed to perform an AR; it does not presume that they have the obligation to accept a request to carry out an AR.

ML.A.902 Validity of the airworthiness review certificate

(a) An ARC becomes invalid if, alternatively:

(1) it is suspended or revoked;

(2) the airworthiness certificate is suspended or revoked;

(3) the aircraft is not in the aircraft register of the State;

(4) the type certificate under which the airworthiness certificate was issued is suspended or revoked.

(b) An aircraft shall not fly if the ARC is invalid or if any of the following circumstances are present:

(1) the continuing airworthiness of the aircraft or any component fitted to the aircraft does not meet the requirements of this Part-ML;

(2) the aircraft does not remain in conformity with the type design approved by the Authority;

(3) the aircraft has been operated beyond the limitations of the approved flight manual or airworthiness certificate, without appropriate action being taken;

(4) the aircraft has been involved in an accident or incident that affects the airworthiness of the aircraft, without subsequent appropriate action to restore airworthiness;

(5) a modification or repair to the aircraft or any component fitted to the aircraft is not in compliance with MCAR-Part-21.

(c) Upon surrender or revocation, the ARC shall be returned to the Authority.

ML.A.903 Airworthiness review process

(a) To satisfy the requirement for the airworthiness review of an aircraft referred to in point ML.A.901, the airworthiness review staff shall perform a documented review of the aircraft records to verify that:

(1) airframe, engine and propeller flying hours and associated flight cycles have been properly recorded;

(2) the flight manual is applicable to the aircraft configuration and reflects the latest revision status;

(3) all the maintenance due on the aircraft according to the AMP has been carried out;

(4) all known defects have been corrected or deferred in a controlled manner;

(5) all applicable ADs have been applied and properly registered;

(6) all modifications and repairs made to the aircraft have been registered and are in compliance with MCAR-Part-21;

(7) all service-life-limited components installed on the aircraft are properly identified, registered and have not exceeded their approved service life limit;

(8) all maintenance has been certified in accordance with this Part-ML;

(9) if required, the current mass-and-balance statement reflects the configuration of the aircraft and is valid;

(10) the aircraft complies with the latest revision of its type design approved by the Authority;

(11) if required, the aircraft holds a noise certificate corresponding to the current configuration of the aircraft in compliance with Subpart I of MCAR-Part-21.

(b) The airworthiness review staff referred to in point (a) shall carry out a physical survey of the aircraft. For this survey, airworthiness review staff not appropriately qualified under MCAR-Part-66 shall be assisted by such qualified personnel.

(c) Through the physical survey of the aircraft, the airworthiness review staff shall ensure that:

(1) all required markings and placards are properly installed;

(2) the aircraft complies with its approved flight manual;

(3) the aircraft configuration complies with the approved documentation;

(4) no evident defect can be found that has not been addressed according to point ML.A.403;

(5) no inconsistencies can be found between the aircraft and the documented review of records as referred to in point (a).

(d) By derogation from point ML.A.901(a), the airworthiness review may be anticipated for a maximum period of 90 days, without loss of continuity of the airworthiness review pattern, so as to allow the physical review to take place during a maintenance check.

(e) The ARC (DCA Form 15c) set out to in Appendix IV shall only be issued:

(1) the Authority;

(2) by appropriately authorised airworthiness review staff;

(3) when the airworthiness review has been completely carried out, all findings have been closed;

(4) when any discrepancy found in the AMP in accordance with point (h) has been satisfactorily addressed.

(f) A copy of any ARC issued or extended for an aircraft shall be sent to the operator within 10 days.

(g) Airworthiness review tasks shall not be subcontracted.

(h) The effectiveness of the AMP may be reviewed in conjunction with the airworthiness review in accordance with point (c)(9) of point ML.A.302. This review shall be completed by the person who performed the airworthiness review. If the review shows deficiencies of the aircraft linked with deficiencies in the content of the AMP, the AMP shall be amended accordingly. The person performing the review shall inform the Authority if he does not agree with the measures amending the AMP taken by the owner, CAMO or CAO. In such case the Authority shall decide which amendments to the AMP are necessary, raising the corresponding findings defined in point ML.B.903 and, if necessary, reacting in accordance with point ML.B.304.

AMC1 ML.A.903(h) Airworthiness review

REVIEW OF AMP IN CONJUNCTION WITH AR

This review of the maintenance programme is performed by the person who performed the AR, who could belong to the Authority, a CAMO, a CAO or a maintenance organisation or could also be independent certifying staff in accordance with ML.A.901(b)(4) M.A.901(g).

This person is not responsible for the completeness of this AMP, but may do some sampling as part of the investigations and the findings discovered during the physical review.

More details on the annual review are provided in AMC1 ML.A.302(c)(9).

ML.A.904 Qualification of airworthiness review staff

(a) Airworthiness review staff authorised to act on behalf of the Authority shall be qualified in accordance with point ML.B.902.

(b) Airworthiness review staff acting on behalf of an organisation referred to in Subpart F or Subpart G of MCAR-Part-M, MCAR-Part-145, MCAR-Part-CAMO or MCAR-Part-CAO shall be qualified in accordance with Subpart F or Subpart G of MCAR-Part-M, MCAR-Part-145, MCAR-Part-CAMO or MCAR-Part-CAO, respectively.

(c) Airworthiness review staff acting on their own behalf, as permitted pursuant to point ML.A.901(b)(4), shall:

(1) hold a licence issued in accordance with MCAR-Part-66 rated for the corresponding aircraft or, if MCAR-Part-66 is not applicable to the particular aircraft, hold a national certifying-staff qualification valid for that aircraft; and

(2) hold an authorisation issued by, alternatively:

(i) the Authority who issued the licence in accordance with MCAR-Part-66;

(ii) if MCAR-Part-66 is not applicable, the Authority responsible for the national certifying-staff qualification.

(d) The authorisation required under point (c)(2) shall be issued by the Authority when:

(1) the Authority has assessed that the person has the knowledge of the parts of this MCAR relevant to continuing-airworthiness management, performance of airworthiness reviews and issuance of ARCs;

(2) the person has satisfactorily performed an airworthiness review under the supervision of the Authority.

This authorisation shall remain valid for a duration of 5 years as long as the holder has performed at least 1 airworthiness review every 12-months. If this is not the case, a new airworthiness review shall be satisfactorily performed under the supervision of the Authority.

Upon expiration of its validity, the authorisation shall be renewed for another 5 years subject to a new compliance with points (d)(1) and (d)(2). There is no limit to the number of renewals.

The holder of the authorisation shall keep records of all the airworthiness reviews performed and shall make them available, upon request, to the Authority and to any aircraft owner for whom they are performing an airworthiness review.

This authorisation may be revoked by the Authority at any time if it is not satisfied with the competence of the holder or with the use of such an authorisation.

GM1 ML.A.904(c);(d) Qualification of airworthiness review staff

AR BY INDEPENDENT CERTIFYING STAFF

(a) ML.A.904(c) and (d) refer to the independent certifying staff. The terms ‘corresponding aircraft’ or ‘particular aircraft’ mean that the person meets at the time of the AR the certifying staff requirements for the aircraft subject to the AR.

(b) The authorisation issued to the certifying staff by the Authority is only granted after assessment of the knowledge required in point (d)(1) and after the satisfactory performance of an AR under supervision of the Authority (point (d)(2)).

ML.A.905 Transfer of aircraft registration from a third country to Mauritius

(a) When transferring an aircraft registration from a third country to Mauritius, the applicant shall:

(1) first, provide the former State with the name of the State in which the aircraft will be registered;

(2) and subsequently apply to Mauritius for the issuance of a new airworthiness certificate in accordance with MCAR-Part-21.

(b) Notwithstanding point (a)(3) of point ML.A.902, the former ARC shall remain valid until its expiry date, except when the ARC was issued by independent certifying staff holding a national certifying-staff qualification in accordance with point (b)(4) of point ML.A.901, in which case point ML.A.906 shall apply.

(c) Notwithstanding points (a) and (b), in those cases where the aircraft was in a non-airworthy condition in the former State or where the airworthiness status of the aircraft cannot be determined using the existing records, point ML.A.906 shall apply.

ML.A.906 Airworthiness review of aircraft imported into Mauritius

(a) When importing an aircraft from a third country into Mauritius, the applicant shall:

(1) apply to the Authority for the issuance of a new airworthiness certificate in accordance with MCAR-Part-21;

(2) for aircraft other than new, have an airworthiness review carried out satisfactorily in accordance with point ML.A.901;

(3) have all maintenance carried out to comply with the approved or declared AMP.

(b) If the aircraft complies with the relevant requirements, the Authority, the CAMO or CAO, the maintenance organisation or the independent certifying staff performing the airworthiness review, as provided for in point (b) of point ML.A.901, shall issue an ARC and shall submit a copy to the Authority, if authorised.

(c) The owner shall allow access to the aircraft for inspection by the Authority.

(d) A new airworthiness certificate shall be issued by the Authority if the aircraft complies with MCAR-Part-21.

ML.A.907 Findings

(a) Findings are categorised as follows:

(1) A Level 1 finding is any finding of significant non-compliance with the requirements of Part-ML to this MCAR which lowers the safety standard and seriously endangers flight safety.

(2) A Level 2 finding is any finding of non-compliance with the requirements of Part-ML to this MCAR which may lower the safety standard and may endanger flight safety.

(b) After receipt of notification of findings in accordance with point ML.B.903, the person or organisation, having responsibilities pursuant to point ML.A.201, shall define and demonstrate to the Authority within a period agreed with the Authority a corrective action plan, aimed at preventing reoccurrence of the finding and its root cause.

SECTION B — PROCEDURE FOR COMPETENT AUTHORITIES

SUBPART A — GENERAL

ML.B.101 Scope

This Section establishes the administrative requirements to be followed by the Authority in charge of the implementation and enforcement of Section A of Part-ML to this MCAR.

ML.B.102 Competent authority

(a) General

The Director of Civil Aviation is the designated authority for Mauritius with allocated responsibilities for the issuance, continuation, change, suspension or revocation of certificates and for the oversight of continuing airworthiness. This competent authority shall establish documented procedures and an organisational structure.

(b) Resources

The number of staff shall be appropriate to satisfy the requirements detailed in this Section.

(c) Qualification and training

All staff involved in activities covered by this Part-ML shall be appropriately qualified and have appropriate knowledge, experience, initial and continuation training to perform their allocated tasks.

(d) Procedures

The Authority shall establish procedures detailing how compliance with this Part-ML is achieved.

The procedures shall be reviewed and amended to ensure continued compliance.

ML.B.104 Record-keeping

(a) The Authority shall establish a system of record-keeping that allows adequate traceability of the process for issuing, continuing, changing, suspending or revoking each certificate and authorisation.

(b) The records for the oversight of each aircraft shall include, as a minimum, a copy of:

(1) the aircraft certificate of airworthiness;

(2) ARCs;

(3) reports from the airworthiness reviews carried out directly by the State;

(4) all relevant correspondence relating to the aircraft;

(5) details of any exemption and enforcement action(s);

(6) any document approved by the Authority pursuant to this Part-ML or the Civil Aviation Regulations.

(c) The records specified in point (b) shall be retained until 2 years after the aircraft has been permanently withdrawn from service.

(d) All records specified in point ML.B.104 shall be made available to any other State or the Authority upon their request

ML.B.105 Mutual exchange of information

(a) In order to contribute to the improvement of aviation safety, the Authority shall participate in a mutual exchange of all the necessary information in accordance with the Data Protection Act.

(b) Without prejudice to the competences of other States, in the case of a potential safety threat involving several States, the competent authorities concerned shall assist each other in carrying out the necessary oversight action.

SUBPART B — ACCOUNTABILITY

ML.B.201 Responsibilities

The competent authority referred to in point (b) of point ML.1 shall be responsible for conducting inspections and investigations in order to verify that the requirements of this Part-ML are complied with.

AMC1 ML.B.201 Responsibilities

Template that can be used by the owner, CAO or CAMO upon request by the Authority to collect information about the AMP

<table>
<tr><th colspan="4">Part-ML aircraft maintenance programme (AMP)</th></tr>
<tr><th colspan="4">Aircraft identification</th></tr>
<tr><td rowspan="2">1</td><td>Registration(s):</td><td>Type:</td><td>Serial no(s):</td></tr>
<tr><td colspan="3">Owner:</td></tr>
<tr><th colspan="4">Which basis is used for the maintenance programme?</th></tr>
<tr><td rowspan="2">2</td><td colspan="2">Design approval holder (DAH) ICA ☐

Tasks alternative to ICA introduced in AMP?
Yes ☐ No ☐</td><td>Minimum inspection programme (MIP) as detailed in the latest revision of AMC ML.A.302(d) ☐
Other MIP complying with ML.A.302(d) ☐</td></tr>
<tr><td colspan="3">Additional maintenance requirements to ICA or MIP: deviations introduced?
Yes ☐ No ☐ Not applicable ☐</td></tr>
<tr><th colspan="4">Approval/declaration of the maintenance programme (select the appropriate option)</th></tr>
<tr><td>3</td><td colspan="3">☐ AMP declared by the owner
☐ Default AMP (ML.A.302(e))
☐ Approved by the contracted CAMO/CAO. Approval reference of the organisation:
_____</td></tr>
</table>

SUBPART C — CONTINUING AIRWORTHINESS

ML.B.302 Exemptions

All exemptions granted in accordance with Article 71 of Regulation (EC) 2018/1139 shall be recorded and retained by the Authority.

ML.B.303 Aircraft continuing-airworthiness monitoring

(a) The Authority shall develop a survey programme following a risk-based approach to monitor the airworthiness status of the fleet of aircraft on its register.

(b) A survey programme shall include sample product surveys of aircraft and shall cover all aspects of airworthiness key risk elements.

(c) A sample product survey shall sample the airworthiness standards achieved, on the basis of the applicable requirements, and identify any findings.

(d) Any findings identified shall be categorised in accordance with point ML.B.903 and confirmed in writing to the person or organisation responsible pursuant to point ML.A.201. The Authority shall have a procedure in place to analyse findings as for their safety significance.

(e) The Authority shall record all findings and closure actions.

(f) If during aircraft monitoring, evidence is found showing non-compliance with this or other MCAR's, the finding shall be dealt with as provided for by the relevant MCAR.

(g) If so required to ensure appropriate enforcement action, the Authority shall exchange information on non-compliances identified in accordance with point (f) with other competent authorities.

AMC1 ML.B.303 Aircraft continuing airworthiness monitoring

The Authority survey programme developed in accordance with Part-M (M.B.303) provides an acceptable basic structure for the survey programme required for Part-ML aircraft.

ML.B.304 Revocation, suspension and limitation

The Authority shall:

(a) suspend an ARC on reasonable grounds in the case of a potential safety threat; or

(b) suspend or revoke an ARC pursuant to point (a) of point ML.B.903.

The Authority who issued the airworthiness review authorisation pursuant to point (c) of point ML.A.904 for independent certifying staff shall revoke such authorisation if the holder shows poor performance of the airworthiness review or uses such authorisation in inappropriate manner.

SUBPART I — AIRWORTHINESS REVIEW CERTIFICATE (ARC)

ML.B.902 Airworthiness review by the Authority

(a) When the Authority carries out the airworthiness review and issues the ARC set out in Appendix IV to this Part-ML (DCA Form 15c), the Authority shall carry out an airworthiness review in accordance with point ML.A.903.

(b) The Authority shall have appropriate airworthiness review staff to carry out the airworthiness reviews. These staff shall have acquired all of the following:

(1) at least 3 years of experience in continuing airworthiness;

(2) an appropriate licence in compliance with MCAR-Part-66 or a nationally-recognised maintenance personnel qualification appropriate to the aircraft category or an aeronautical degree or equivalent;

(3) an appropriate aeronautical-maintenance training;

(4) a position that authorises that person to sign on behalf of the Authority.

Notwithstanding points (1) to (4), the requirement of point ML.B.902(b)(2) may be replaced by 4 years of experience in continuing airworthiness, in addition to those already required by point ML.B.902(b)(1).

(c) The Authority shall maintain a record of all airworthiness review staff, which shall include details of any appropriate qualification held together with a summary of relevant continuing airworthiness management experience and training.

(d) During the performance of the airworthiness review, the Authority shall have access to the applicable data as specified in points ML.A.305 and ML.A.401.

(e) The staff that carries out the airworthiness review shall issue an airworthiness review certificate (DCA Form 15c), as set out in Appendix IV, after satisfactory completion of the airworthiness review.

(f) Whenever circumstances reveal the existence of a potential safety threat, the Authority shall carry out the airworthiness review and issue the ARC itself.

ML.B.903 Findings

If during aircraft surveys or by other means, evidence is found showing non-compliance with requirements of this Part-ML, the Authority shall:

(a) for Level 1 findings, require appropriate corrective action to be taken before further flight, and immediately revoke or suspend the ARC; and

(b) for Level 2 findings, impose the corrective action appropriate to the nature of the finding.

APPENDICES TO PART-ML OF THIS MCAR

Appendix I — Continuing-airworthiness management contract

(a) When an owner contracts in accordance with point ML.A.201 a CAMO or CAO to carry out continuing airworthiness management tasks, upon request by the Authority, a copy of the contract signed by both parties shall be sent by the owner to the Authority.

(b) The contract shall be developed taking into account the requirements of this Part-ML and shall define the obligations of the signatories in relation to the continuing airworthiness of the aircraft.

(c) It shall contain, as a minimum the following information:

(1) the aircraft registration, type and serial number;

(2) the aircraft owner's or registered lessee's name or company details including the address;

(3) details of the contracted CAMO or CAO, including the address;

(4) the type of operation.

(d) It shall state the following:

'The owner entrusts the CAMO or CAO with the management of the continuing airworthiness of the aircraft, the development and approval of a maintenance programme, and the organisation of the maintenance of the aircraft according to said maintenance programme.

According to the present contract, both signatories undertake to follow the respective obligations of this contract.

The owner declares, to the best of its knowledge, that all the information given to the CAMO or CAO concerning the continuing airworthiness of the aircraft is and will be accurate, and that the aircraft will not be altered without prior approval of the CAMO or CAO.

In case of any non-conformity with this contract, by either of the signatories, the contract will become null. In such a case, the owner will retain full responsibility for every task linked to the continuing airworthiness of the aircraft, and the owner will inform the competent authoritie(s) of the State of registry within 2 weeks about the termination of the contract.'

(e) When an owner contracts a CAMO or CAO in accordance with point ML.A.201, the obligations of each party shall be assigned as follows:

(1) Obligations of CAMO or CAO:

(i) have the aircraft type included in its terms of approval;

(ii) respect all the conditions listed below with regard to maintaining the continuing airworthiness of the aircraft:

(A) develop and approve the AMP for the aircraft;

(B) once it has been approved, provide the owner with a copy of the AMP, as well as a copy of the justifications for any deviations from the DAH's recommendations;

(C) organise a bridging inspection using the aircraft's prior AMP;

(D) organise that all maintenance is carried out by an approved maintenance organisation or, if permitted, by independent certifying staff;

(E) organise that all applicable ADs are applied;

(F) organise that all defects discovered during maintenance, airworthiness reviews or reported by the owner are corrected by an approved maintenance organisation or, if permitted, by independent certifying staff;

(G) coordinate scheduled maintenance, the application of ADs, the replacement of service-life-limited parts, and component inspection requirements;

(H) inform the owner each time the aircraft must be brought to an approved maintenance organisation or, if permitted, to independent certifying staff;

(I) manage and archive all technical records;

(iii) organise the approval of any modification to the aircraft in accordance with MCAR-Part-21 before this modification is embodied;

(iv) organise the approval of any repair to the aircraft in accordance with MCAR-Part-21 before this repair is carried out;

(v) inform the Authority whenever the aircraft is not presented by the owner for maintenance as requested by the contracted CAMO or CAO;

(vi) inform the Authority whenever the present contract has not been respected;

(vii) ensure that the airworthiness review of the aircraft is carried out, when necessary, and ensure that the ARC is issued;

(viii) send within 10 days a copy of any ARC issued or extended to the Authority;

(ix) carry out all occurrence reporting mandated by applicable regulations;

(x) inform the Authority whenever the present contract is denounced by either party.

(2) Obligations of the owner:

(i) have a general understanding of the AMP;

(ii) have a general understanding of this Part-ML;

(iii) present the aircraft for maintenance as directed by the contracted CAMO or CAO;

(iv) not modify the aircraft without first consulting the contracted CAMO or CAO;

(v) inform the contracted CAMO or CAO of all maintenance exceptionally carried out without the knowledge and control of the contracted CAMO or CAO;

(vi) report to the contracted CAMO or CAO through the logbook all defects found during operations;

(vii) inform the Authority whenever the present contract is denounced by either party;

(viii) inform the Authority and the contracted CAMO or CAO whenever the aircraft is sold;

(ix) carry out all occurrence reporting mandated by applicable regulations;

(x) inform on a regular basis the contracted CAMO or CAO about the aircraft flying-hours and any other utilisation data, as agreed with the contracted CAMO or CAO;

(xi) enter the CRS in the logbooks, as mentioned in point ML.A.803(c), when performing pilot-owner maintenance;

(xii) inform the contracted CAMO or CAO no later than 30 days after completion of any Pilot-owner maintenance task.

Appendix II — Limited Pilot-owner maintenance

In addition to the requirements laid down in this Part-ML, the pilot-owner shall comply with the following basic principles before it carries out any maintenance task:

(a) Competence and responsibility

(1) The pilot-owner shall always be responsible for any maintenance he performs.

(2) The pilot-owner shall hold satisfactory level of competence to perform the task. It is the responsibility of a pilot-owner to familiarise himself with the standard maintenance practices for his aircraft and with the AMP.

(b) Tasks

The Pilot-owner may carry out simple visual inspections or operations to check the airframe, engines, systems and components for general condition, obvious damage and normal operation.

A maintenance task shall not be released by the pilot-owner if any of the following conditions occurs:

(1) it is a critical maintenance task;

(2) it requires the removal of major components o r a major assembly;

(3) it is carried out in compliance with an AD or an airworthiness limitation item (ALI) unless specifically allowed in the AD or the ALI;

(4) it requires the use of special tools or calibrated tools (except for torque wrench and crimping tool);

(5) it requires the use of test equipment or special testing (e.g. non-destructive testing (NDT), system tests or operational checks for avionics equipment);

(6) it is composed of any unscheduled special inspections (e.g. heavy-landing check);

(7) it affects systems essential for the instrumental flight rules (IFR) operations;

(8) it is a complex maintenance task in accordance with Appendix III, or it is a component maintenance task in accordance with point (a) or (b) of point ML.A.502;

(9) it is part of the 100-h/annual check (for those cases the maintenance task is combined with the airworthiness review performed by maintenance organisations or independent certifying staff).

The criteria referred to in points (1) to (9) cannot be overridden by less restrictive instructions issued in accordance with the AMP referred to in point ML.A.302.

Any task described in the aircraft flight manual (or other operational manuals), for example preparing the aircraft for flight (assembling the sailplane wings, or performing a preflight inspection, or assembling a basket, burner, fuel cylinders and an envelope combination for a balloon, etc.), is not considered a maintenance task and, therefore, does not require a CRS. Nevertheless, the person assembling those parts is responsible for ensuring that those parts are eligible for installation and in a serviceable condition.

(c) Performance and records of the pilot-owner maintenance tasks

The maintenance data, as specified in point ML.A.401, must always be available during the conduct of pilot-owner maintenance and must be complied with. Details of the data referred to in the conduct of pilot-owner maintenance must be included in the CRS in accordance with point (d) of point ML.A.803.

The pilot-owner must inform the contracted CAMO or CAO (if such contract exists) about the completion of the pilot-owner maintenance tasks no later than 30 days after completion of these tasks in accordance with point (a) of point ML.A.305.

AMC1 to Appendix II to Part-ML — Limited pilot-owner maintenance

(a) The lists below specifies items that may be expected to be completed by an owner who holds a current and valid pilot licence for the aircraft type involved and who meets the competence and responsibility requirements of Appendix II to Part-ML.

(b) The list of tasks may not address in a detailed manner the specific needs of the various aircraft categories. In addition, the development of technology and the nature of the operations undertaken by these categories of aircraft may not always be adequately considered.

(c) Any other task meeting the requirements of Appendix II to Part-ML may also be performed by the pilot-owner.

(d) Therefore, the following lists are considered to meet the representative scope of limited pilot-owner maintenance referred to in ML.A.803 and Appendix II to Part-ML:

(1) Part A applies to aeroplanes;

(2) Part B applies to rotorcraft;

(3) Part C applies to sailplanes and powered sailplanes; and

(4) Part D applies to balloons and airships.

(e) Inspection tasks/checks of any periodicity included in an approved maintenance programme can be carried out provided that the specified tasks are compliant with the basic principles of Appendix II to Part-ML.

The content of periodic inspections/checks as well as their periodicity is not regulated or standardised in an aviation specification. It is the decision of the DAH to recommend a schedule for each specific type of inspection/check.

For an inspection/check with the same periodicity for different aircraft, the content may differ and in some cases, may be critically safety-related and need the use of special tools or knowledge and thus, not qualify for pilot-owner maintenance. Therefore, the maintenance carried out by the pilot-owner should not be generalised to specific inspections such as of a 50-h, 100-h or 6-month periodicity.

The inspections to be carried out are limited to those areas and tasks listed in this AMC to Appendix II; this allows flexibility in the development of the maintenance programme and does not limit the inspection to certain specific periodic inspections. A 50-h/6-month periodic inspection for a fixed-wing aeroplane as well as the 1-year inspection for a glider may normally be eligible for pilot-owner maintenance.

TABLES

Note: Tasks in Part A or Part B marked with '**' exclude IFR operations following pilot-owner maintenance. For these aircraft to operate under IFR, these tasks should be released by an appropriate certifying staff.

Part A — PILOT-OWNER MAINTENANCE TASKS FOR POWERED AIRCRAFT (AEROPLANES)

ATA	Area	Task	Aeroplanes
09	Towing	Tow release unit and tow cable retraction mechanism — cleaning, lubrication and tow cable replacement (including weak links)	Yes
		Mirror — installation and replacement of mirrors	Yes
11	Placards	Placards, markings — installation and renewal of placards and markings required by the AFM and the AMM	Yes
12	Servicing	Those items not requiring a disassembly of other than non-structural items, such as cover plates, cowlings and fairings — lubrication	Yes
20	Standard practices	Safety wiring — replacement of defective safety wiring or cotter keys, excluding those in engine controls, transmission controls and flight control systems	Yes
		Simple non-structural standard fasteners — replacement and adjustment, excluding the replacement of receptacles and anchor nuts requiring riveting	Yes
21	Air conditioning	Replacement of flexible hoses and ducts	Yes
23	Communication	Communication devices — remove and replace self-contained, instrument-panel-mounted communication devices with quick-disconnect connectors, excluding IFR operations	Yes**

ATA	Area	Task	Aeroplanes
24	Electrical power	Batteries — replacement and servicing	Yes
		Wiring — repairing broken circuits in non-critical equipment, excluding ignition system, primary generating system and required communication, as well as navigation system and primary flight instruments	Yes
		Bonding — replacement of broken bonding cable	Yes
		Fuses — replacement using the correct rating	Yes
25	Equipment	Safety belts — replacement of safety belts and harnesses excluding belts fitted with airbag systems	Yes
		Seats — replacement of seats or seat parts not involving disassembly of any primary structure or control system	Yes
		Non-essential instruments and/or equipment — replacement of self-contained, instrument-panel-mounted equipment with quick-disconnect connectors	Yes
		Oxygen system — replacement of portable oxygen bottles and systems in approved mountings, excluding permanently installed bottles and systems	Yes
		Emergency locator transmitter (ELT) — removal/reinstallation	Yes
27	Flight controls	Removal or reinstallation of co-pilot control column and rudder pedals where design provides for quick disconnect	Yes
28	Fuel system	Fuel filter elements — cleaning and/or replacement	Yes
30	Ice and rain protection	Windscreen wiper — replacement of wiper blade	Yes
31	Instruments	Instrument panel — removal and reinstallation provided that this is a design feature with quick-disconnect connectors, excluding IFR operations	Yes**
		Pitot-static system — simple sense and leak check, excluding IFR operations	Yes**
		Drainage — drainage of water drainage traps or filters within the pitot-static system, excluding IFR operations	Yes**
		Instruments — checking of markings for legibility and that those readings are consistent with ambient conditions	Yes
32	Landing gear	Wheels — removal, replacement and servicing, including replacement of wheel bearings and lubrication	Yes
		Servicing — replenishment of hydraulic fluid	Yes
		Shock absorber — replacement of elastic cords or rubber dampers	Yes
		Shock struts — replenishment of oil or air	Yes
		Skis — changing between wheel and ski landing gear	Yes
		Landing skids — replacement of landing skids and skid shoes	Yes
		Wheel fairings (spats) — removal and reinstallation	Yes
		Mechanical brakes — adjustment of simple cable-operated systems	Yes
		Brake — replacement of worn brake pads	Yes
33	Lights	Lights — replacement of internal and external bulbs, filaments, reflectors and lenses	Yes
34	Navigation	Software — updating self-contained, instrument-panel-mounted software, excluding automated flight control systems and transponders	Yes
		Navigation devices — removal and replacement of self-contained, instrument-panel-mounted navigation devices	Yes**

ATA	Area	Task	Aeroplanes
		with quick-disconnect connectors, excluding automated flight control systems, transponders, primary flight control system and IFR operations	
		Self-contained data logger — installation, data restoration	Yes
51	Structure	Fabric patches — simple patches extending over no more than one rib, and not requiring rib stitching or removal of structural parts or control surfaces	Yes
		Protective coating — application of preservative material or coatings where no disassembly of any primary structure or operating system is involved	Yes
		Surface finish — minor restoration (where no disassembly of any primary structure or operating system is involved), including application of signal coatings or thin foils as well as registration markings	Yes
		Fairings — simple repairs to non-structural fairings and cover plates that do not change the contour	Yes
52	Doors and hatches	Doors — removal and reinstallation	Yes
53	Fuselage	Upholstery, furnishing — minor repairs that do not require disassembly of primary structure or operating systems, or interfere with control systems	Yes
56	Windows	Side windows — replacement if no riveting, bonding or any special process is required	Yes
61	Propeller	Spinner — removal and reinstallation	Yes
71	Power plant installation	Cowling — removal and reinstallation not requiring removal of propeller or disconnection of flight controls	Yes
		Induction system — inspection and replacement of induction air filter	Yes
72	Engine	Chip detectors — removal, checking and reinstallation provided that the chip detector is of a non-electrically-indicated self-sealing type	Yes
73	Engine fuel	Strainer or filter elements — cleaning and/or replacement	Yes
		Fuel — mixing of required oil into fuel	Yes
74	Ignition	Spark plugs — removal, cleaning, adjustment and reinstallation	Yes
75	Cooling	Coolant — replenishment of coolant fluid	Yes
77	Engine-indicating system	Engine-indicating system — removal and replacement of self-contained, instrument-panel-mounted indicators that have quick-release connectors and do not employ direct reading connections	Yes
79	Oil system	Strainer or filter elements — cleaning and/or replacement	Yes
		Oil — changing or replenishment of engine oil and gearbox fluid	Yes

Part B — PILOT-OWNER MAINTENANCE TASKS FOR ROTORCRAFT

ATA	Area	Task	Rotorcraft
11	Placards	Placards, markings — installation and renewal of placards and markings required by the AFM and the AMM	Yes
12	Servicing	Fuel, oil, hydraulic, de-iced and windshield liquid replenishment	Yes
		Those items not requiring a disassembly of other than non-structural items, such as cover plates, cowlings and fairings — lubrication	Yes
20	Standard practices	Safety wiring — replacement of defective safety wiring or cotter keys, excluding those in engine controls, transmission controls and flight control systems	Yes
		Simple non-structural standard fasteners — replacement and adjustment, excluding latches as well as the replacement of receptacles and anchor nuts requiring riveting	Yes
21	Air conditioning	Replacement of flexible hoses and ducts	Yes
23	Communication	Communication devices — removal and replacement of self-contained, instrument-panel-mounted communication devices with quick-disconnect connectors, excluding IFR operations	Yes**
24	Electrical power	Batteries — replacement and servicing, excluding servicing of Ni-Cd batteries and IFR operations	Yes**
		Wiring — repairing broken circuits in non-critical equipment, excluding ignition system, primary generating system and required communication, navigation system and primary flight instruments	Yes
		Bonding — replacement of broken bonding cable, excluding bonding of rotating parts and flying controls	Yes
		Fuses — replacement using the correct rating	Yes
25	Equipment	Safety belts — replacement of safety belts and harnesses, excluding belts fitted with airbag systems	Yes
		Seats — replacement of seats or seat parts not involving disassembly of any primary structure or control system, excluding flight crew seats	Yes
		Removal/installation of emergency flotation gears with quick-disconnect connectors	Yes
		Non-essential instruments and/or equipment — replacement of self-contained, instrument-panel-mounted equipment with quick-disconnect connectors	Yes
		ELT — removal/reinstallation	Yes
30	Protection from ice and rain	Windshield wiper replacement	Yes
31	Instruments	Instrument panel — removal and reinstallation provided that it is a design feature with quick-disconnect connectors, excluding IFR operations	Yes**
		Pitot-static system — simple sense and leak check, excluding IFR operations	Yes**
		Drainage — drainage of water drainage traps or filters within the pitot-static system, excluding IFR operations	Yes**
		Instruments — checking of markings for legibility and that those readings are consistent with ambient conditions	Yes
32	Landing gear	Wheels — removal, replacement and servicing, including replacement of wheel bearings and lubrication	Yes

ATA	Area	Task	Rotorcraft
		Replacement of skid wear shoes	Yes
		Fitting and removal of snow landing pads	Yes
		Servicing — replenishment of hydraulic fluid	Yes
		Brake — replacement of worn brake pads	Yes
33	Lights	Lights — replacement of internal and external bulbs, filaments, reflectors and lenses	Yes
34	Navigation	Software — updating of self-contained, instrument-panel-mounted software, excluding automated flight control systems and transponders	Yes
		Navigation devices — removal and replacement of self-contained, instrument-panel-mounted navigation devices with quick-disconnect connectors, excluding automated flight control systems, transponders, primary flight control system and IFR operations	Yes**
		Self-contained data logger — installation, data restoration	Yes
51	Structure	Protective coating — application of preservative material or coatings where no disassembly of any primary structure or operating system is involved	Yes
		Surface finish — minor restoration (where no disassembly of any primary structure or operating system is involved, excluding intervention on main and tail rotors), including application of signal coatings or thin foils as well as registration markings	Yes
		Fairings — simple repairs to non-structural fairings and cover plates that do not change the contour	Yes
52	Doors	Doors — removal and reinstallation	Yes
53	Fuselage	Upholstery, furnishing — minor repairs that do not require disassembly of primary structure or operating systems, or interfere with control systems	Yes
56	Windows	Side windows — replacement if no riveting, bonding or any special process is required	Yes
62	Main rotor	Removal/installation of main-rotor blades (designed for removal where special tools are not required, excluding tail-rotor blades), limited to reinstallation of the same blades previously removed in the original position	Yes
63 65	Transmission	Chip detectors — removal, checking and replacement provided that the chip detector is of a non-electrically-indicated self-sealing type	Yes
67	Flight control	Removal or reinstallation of co-pilot cyclic and collective controls and yaw pedals where design provides for quick disconnect	Yes
71	Power plant installation	Cowlings — removal and refitment	Yes
72	Engine	Chip detectors — removal, checking and reinstallation provided that the chip detector is of a non-electrically-indicated self-sealing type	Yes
79	Oil system	Filter elements — replacement, provided that the element is of the ‘spin on/off’ type	Yes
		Oil — changing or replenishment of engine oil	Yes

Part C — PILOT-OWNER MAINTENANCE TASKS FOR SAILPLANES AND POWERED SAILPLANES

Abbreviations/acronyms applicable to this Part:

- n/a not applicable for this category;
- SP sailplane;
- SSPS self-sustained powered sailplane; and
- SLPS/TMG self-launching powered sailplane/touring motor glider.

ATA	Area	Task	SP	SSPS	SLPS/TMG
08	Weighing	Recalculation, small changes of the trim plan without needing a reweighing	Yes	Yes	Yes
09	Towing	Tow release unit and tow cable retraction mechanism — cleaning, lubrication and tow cable replacement (including weak links)	Yes	Yes	Yes
		Mirror — installation and replacement of mirrors	Yes	Yes	Yes
11	Placards	Placards, markings — installation and renewal of placards and markings required by the AFM and the AMM	Yes	Yes	Yes
12	Servicing	Those items not requiring a disassembly of other than non-structural items, such as cover plates, cowlings and fairings — lubrication	Yes	Yes	Yes
20	Standard practices	Safety wiring — replacement of defective safety wiring or cotter keys, excluding those in engine controls, transmission controls and flight control systems	Yes	Yes	Yes
		Simple non-structural standard fasteners — replacement and adjustment, excluding the replacement of receptacles and anchor nuts requiring riveting	Yes	Yes	Yes
		Free play — measurement of the free play in the control system and the wing-to-fuselage attachment, including minor adjustments by simple means provided by the manufacturer	Yes	Yes	Yes
21	Air conditioning	Replacement of flexible hoses and ducts	Yes	Yes	Yes
23	Communication	Communication devices — removal and replacement of self-contained, instrument-panel-mounted communication devices with quick-disconnect connectors	Yes	Yes	Yes
24	Electrical power	Batteries and solar panels — replacement and servicing	Yes	Yes	Yes
		Wiring — installation of simple wiring connections to the existing wiring for additional non-required equipment, such as electric variometers, flight computers, but excluding required communication, navigation systems and engine wiring	Yes	Yes	Yes
		Wiring — repairing of broken circuits in landing light and any other wiring for non-required	Yes	Yes	Yes

ATA	Area	Task	SP	SSPS	SLPS/TMG
		equipment, such as electrical variometers or flight computers, excluding ignition system, primary generating system, required communication and navigation system, as well as primary flight instruments			
		Bonding — replacement of broken bonding cable	Yes	Yes	Yes
		Switches — this includes soldering and crimping of non-required equipment, such as electrical variometers or flight computers, but excluding ignition system, primary generating system, required communication and navigation system, as well as primary flight instruments	Yes	Yes	Yes
		Fuses — replacement using the correct rating	Yes	Yes	Yes
25	Equipment	Safety belts — replacement of safety belt and harnesses	Yes	Yes	Yes
		Seats — replacement of seats or seat parts not involving disassembly of any primary structure or control system	Yes	Yes	Yes
		Non-essential instruments and/or equipment — replacement of self-contained, instrument-panel-mounted equipment with quick-disconnect connectors	Yes	Yes	Yes
		Removal and installation of non-required instruments and/or equipment	Yes	Yes	Yes
		Wing wiper, cleaner — servicing, removal and reinstallation not involving disassembly or modification of any primary structure and/or control	Yes	Yes	Yes
		Static probes — removal or reinstallation of variometer static-and-total-energy compensation probes	Yes	Yes	Yes
		Oxygen system — replacement of portable oxygen bottles and systems in approved mountings, excluding permanently installed bottles and systems	Yes	Yes	Yes
		Air brake chute — installation and servicing	Yes	Yes	Yes
		ELT — removal/reinstallation	Yes	Yes	Yes
26	Fire protection	Fire warning — replacement of sensors and indicators	n/a	Yes	Yes
27	Flight control	Gap seals — installation and servicing if no complete flight control removal is required	Yes	Yes	Yes
		Control system — measurement of the control system travel without removing the control surfaces	Yes	Yes	Yes
		Control cables — simple optical inspection for condition	Yes	Yes	Yes
		Gas dampener — replacement of gas dampener in the control or air brake system	Yes	Yes	Yes
		Co-pilot stick and pedals — removal or reinstallation where design provides for quick disconnect	Yes	Yes	Yes
28	Fuel system	Fuel lines — replacement of prefabricated fuel lines fitted with self-sealing couplings	n/a	Yes	No

ATA	Area	Task	SP	SSPS	SLPS/TMG
		Fuel filter — cleaning and/or replacement	n/a	Yes	Yes
31	Instruments	Instrument panel — removal and reinstallation provided that it is equipped with quick disconnect, excluding IFR operations	Yes	Yes	Yes
		Pitot-static system — simple sense and leak check	Yes	Yes	Yes
		Instrument panel vibration damper/shock absorbers — replacement	Yes	Yes	Yes
		Drainage — drainage of water drainage traps or filters within the pitot-static system	Yes	Yes	Yes
		Flexible tubes — replacement of damaged tubes	Yes	Yes	Yes
32	Landing gear	Wheels — removal, replacement and servicing, including replacement of wheel bearings and lubrication	Yes	Yes	Yes
		Servicing — replenishment of hydraulic fluid	Yes	Yes	Yes
		Shock absorber — replacement or servicing of elastic cords or rubber dampers	Yes	Yes	Yes
		Shock struts — replenishment of oil or air	Yes	Yes	Yes
		Landing-gear doors — removal or reinstallation and repair including operating straps	Yes	Yes	Yes
		Skis — changing between wheel and ski landing gear	Yes	Yes	Yes
		Skids — removal or reinstallation and servicing of main, wing and tail skids	Yes	Yes	Yes
		Wheel fairings (spats) — removal and reinstallation	Yes	Yes	Yes
		Mechanical brakes — adjustment of simple cable-operated systems	Yes	Yes	Yes
		Brake — replacement of worn brake pads	Yes	Yes	Yes
		Springs — replacement of worn or aged springs	Yes	Yes	Yes
		Gear warning — removal or reinstallation of simple gear-warning systems	Yes	Yes	Yes
33	Lights	Lights — replacement of internal and external bulbs, filaments, reflectors and lenses	n/a	n/a	Yes
34	Navigation	Software — updating of self-contained, instrument-panel-mounted software, excluding automated flight control systems and transponders, and including update of non-required instruments/equipment	Yes	Yes	Yes
		Navigation devices — removal and replacement of self-contained, instrument-panel-mounted navigation devices with quick-disconnect connectors, excluding automated flight control systems, transponders, primary flight control system	Yes	Yes	Yes
		Self-contained data logger — installation, data restoration	Yes	Yes	Yes
51	Structure	Fabric patches — simple patches extending over no more than one rib, and not requiring rib stitching or removal of structural parts or control surfaces	Yes	Yes	Yes

ATA	Area	Task	SP	SSPS	SLPS/TMG
		Protective coating — application of preservative material or coatings where no disassembly of any primary structure or operating system is involved	Yes	Yes	Yes
		Surface finish — minor restoration of paint or coating (where the underlying primary structure is not affected), including application of signal coatings or thin foils as well as registration markings	Yes	Yes	Yes
		Fairings — simple repairs to non-structural fairings and cover plates that do not change the contour	Yes	Yes	Yes
52	Doors	Doors — removal and reinstallation	Yes	Yes	Yes
53	Fuselage	Upholstery, furnishing — minor repairs which do not require disassembly of primary structure or operating systems, or interfere with control systems	Yes	Yes	Yes
56	Windows	Side windows — replacement if no riveting, bonding or any special process is required	Yes	Yes	Yes
		Canopies — removal and refitment	Yes	Yes	Yes
		Gas dampener — replacement of canopy gas dampener	Yes	Yes	Yes
57	Wings	Wing skids — removal or reinstallation and service of lower wing skids or wing roller including spring assembly	Yes	Yes	Yes
		Water ballast — removal or reinstallation of flexible tanks	Yes	Yes	Yes
		Turbulator and sealing tapes — removal or reinstallation of approved sealing tapes and turbulator tapes	Yes	Yes	Yes
61	Propeller	Spinner — removal and reinstallation	n/a	Yes	Yes
71	Power plant installation	Removal or installation of power plant unit including engine and propeller	n/a	Yes	No
		Cowling — removal and reinstallation not requiring removal of propeller or disconnection of flight controls	n/a	Yes	Yes
		Induction system — inspection and replacement of induction air filter	n/a	Yes	Yes
72	Engine	Chip detectors — removal, checking and reinstallation provided that the chip detector is of a non-electrically indicated self-sealing type	n/a	Yes	Yes
73	Engine fuel	Strainer or filter elements — cleaning and/or replacement	n/a	Yes	Yes
		Fuel — mixing of required oil into fuel	n/a	Yes	Yes
74	Ignition	Spark plugs — removal, cleaning, adjustment and reinstallation	n/a	Yes	Yes
75	Cooling	Coolant — replenishment of coolant fluid	n/a	Yes	Yes
76	Engine controls	Controls — minor adjustments of non-flight or propulsion controls whose operation is not critical for any flight phase	n/a	Yes	No
77	Engine-indicating system	Engine-indicating system — removal and replacement of self-contained instrument-panel-mounted indicators that have quick-release	n/a	Yes	Yes

ATA	Area	Task	SP	SSP S	SLPS/TM G
		connectors and do not employ direct reading connections			
79	Oil system	Strainer or filter elements — cleaning and/or replacement	n/a	Yes	Yes
		Oil — changing or replenishment of engine oil and gearbox fluid	n/a	Yes	Yes

Part D — PILOT-OWNER MAINTENANCE TASKS FOR BALLOONS/AIRSHIPS

Area and task	Hot-air airship	Hot-air balloon	Gas balloon
(A) ENVELOPE			
(1) Fabric repairs — excluding complete panels (as defined in, and in accordance with, the TC holder's instructions) not requiring load tape repair or replacement	Yes	Yes	NO
(2) Nose line — replacement	Yes	n/a	n/a
(3) Banners — fitment, replacement or repair (without sewing)	Yes	Yes	Yes
(4) Melting link (temperature flag) — replacement	Yes	Yes	n/a
(5) Temperature transmitter and temperature indication cables — removal or reinstallation	Yes	Yes	n/a
(6) Crown line — replacement (where permanently attached to the crown ring)	No	Yes	n/a
(7) Scoop or skirt — replacement or repair (including fasteners)	Yes	Yes	n/a
(B) BURNER			
(8) Burner — cleaning and lubrication	Yes	Yes	n/a
(9) Piezo igniters — adjustment	Yes	Yes	n/a
(10) Burner jets — cleaning and replacement	Yes	Yes	n/a
(11) Burner frame corner buffers — replacement or reinstallation	Yes	Yes	n/a
(12) Burner valves — adjustment of closing valve not requiring special tools or test equipment	Yes	Yes	n/a
(13) Burner hoses – replacement of O-rings in the inlet connection	Yes	Yes	n/a
(C) BASKET AND GONDOLA			
(14) Basket/gondola frame trim — repair or replacement	Yes	Yes	Yes
(15) Basket/gondola runners (including wheels) — repair or replacement	Yes	Yes	Yes
(16) External rope handles — repair	Yes	Yes	Yes
(17) Seat covers, upholsteries and safety belts — replacement	Yes	Yes	Yes
(D) FUEL CYLINDER			
(18) Liquid valve — replacement of O-rings in the outlet	Yes	Yes	No
(E) INSTRUMENTS AND EQUIPMENT			
(19) Batteries — replacement of batteries for self-contained instruments and communication equipment	Yes	Yes	Yes
(20) Communication, navigation devices, instruments and/or equipment — removal and replacement of self-contained, instrument-panel-mounted communication devices with quick-disconnect connectors	Yes	Yes	Yes
(F) ENGINES			
(21) Cleaning and lubrication not requiring disassembly of other than non-structural items, such as cover plates, cowlings and fairings	Yes	n/a	n/a

(21) Cowling removal and refitment not requiring removal of the propeller	Yes	n/a	n/a
(22) Fuel and oil strainers and/or filter elements — removal, cleaning and/or replacement	Yes	n/a	n/a
(23) Batteries — replacement and servicing (excluding servicing of Ni-Cd batteries)	Yes	n/a	n/a
(24) Propeller spinner — removal and installation for inspection	Yes	n/a	n/a
(25) Power plant — removal or installation of power plant unit including engine and propeller	Yes	n/a	n/a
(26) Engine chip detectors — removal, checking and replacement	Yes	n/a	n/a
(27) Ignition spark plug — removal or installation and adjustment including gap clearance	Yes	n/a	n/a
(28) Coolant fluid — replenishment	Yes	n/a	n/a
(29) Engine controls — minor adjustments of non-flight or propulsion controls whose operation is not critical for any flight phase	Yes	n/a	n/a
(30) Engine instruments — removal and replacement	Yes	n/a	n/a
(31) Lubrication oil — changing or replenishment of engine oil and gearbox fluid	Yes	n/a	n/a
(32) Fuel lines — replacement of prefabricated hoses with self-sealing couplings	Yes	n/a	n/a
(33) Air filters (if installed) — removal, cleaning and replacement	Yes	n/a	n/a

Appendix III — Complex maintenance tasks not to be released by the Pilot-owner

All of the following constitutes the complex maintenance tasks which, according to Appendix II, shall not be carried out by the pilot-owner. Those tasks shall be released either by an approved maintenance organisation or by independent certifying staff:

(a) the modification, repair or replacement by riveting, bonding, laminating, or welding of any of the following airframe parts:

(1) a box beam;

(2) a wing stringer or chord member;

(3) a spar;

(4) a spar flange;

(5) a member of a truss type beam;

(6) the web of a beam;

(7) a keel or chine member of a flying boat hull or a float;

(8) a corrugated sheet compression member in a wing or tail surface;

(9) a wing main rib;

(10) a wing or tail surface brace strut;

(11) an engine mount;

(12) a fuselage longeron or frame;

(13) a member of a side truss, horizontal truss or bulkhead;

(14) a seat support brace or bracket;

(15) a seat rail replacement;

(16) a landing-gear strut or brace strut;

(17) an axle;

(18) a wheel; and

(19) a ski or ski pedestal, excluding the replacement of a low-friction coating;

(b) the modification or repair of any of the following parts:

(1) aircraft skin or the skin of an aircraft float if the work requires the use of a support, jig or fixture;

(2) aircraft skin that is subject to pressurisation loads if the damage to the skin measures more than 15 cm (6 in.) in any direction;

(3) a load-bearing part of a control system, including a control column, pedal, shaft, quadrant, bell crank, torque tube, control horn and forged or cast bracket, but excluding:

(i) the swaging of a repair splice or cable fitting; and

(ii) the replacement of a push-pull tube end fitting that is attached by riveting;

(4) any other structure not listed in point (a) that a manufacturer has identified as primary structure in their maintenance manual, structural repair manual or instructions for continuing airworthiness;

(c) the performance of all of the following maintenance on a piston engine:

(1) dismantling and subsequent reassembling of a piston engine other than:

(i) to obtain access to the piston/cylinder assemblies; or

(ii) to remove the rear accessory cover to inspect and/or replace oil pump assemblies, where such work does not involve the removal and refitment of internal gears;

(2) dismantling and subsequent reassembling of reduction gears;

(3) welding and brazing of joints, other-than-minor weld repairs to exhaust units carried out by a suitably approved or authorised welder but excluding component replacement;

(4) the disturbing of individual parts of units which are supplied as bench-tested units except for the replacement or adjustment of items normally replaceable or adjustable in service;

(d) the balancing of a propeller, except:

(1) for the certification of static balancing where required by the maintenance manual; and

(2) dynamic balancing on installed propellers using electronic balancing equipment where permitted by the maintenance manual or other approved airworthiness data;

(e) any additional task that requires:

(1) specialised tooling, equipment or facilities; or

(2) significant coordination procedures because of the extensive duration of the tasks and the involvement of several persons.

Appendix IV — Airworthiness review certificate (DCA Form 15c)

NOTE: persons and organisations performing the airworthiness review in combination with the 100-h/annual inspection may use the reverse side of this form in order to issue the CRS referred to in point ML.A.801 corresponding to the 100-h/annual inspection.

AIRWORTHINESS REVIEW CERTIFICATE (ARC) (for aircraft complying with Part-ML)
ARC reference: ……..

Pursuant to the Civil Aviation Regulations:

[NAME OF THE AUTHORITY]

hereby certifies that:
☐ … it has performed an airworthiness review in accordance with MCAR-Part-CAMO on the following aircraft:
[or]
☐ … the following new aircraft:
Aircraft manufacturer: ……Manufacturer's designation: ……
Aircraft registration: ……Aircraft serial number: ……
(and) is considered airworthy at the time of the review.
Date of issue: ..... Date of expiry: ……
Airframe flight hours (FH) at date of review (*): ……..
Signed: ..... Authorisation No (if applicable): ……..

[OR]

[NAME OF APPROVED ORGANISATION, ADDRESS and APPROVAL REFERENCE] (**)
[or]
[FULL NAME OF THE CERTIFYING STAFF AND PART-66 LICENCE NUMBER (OR NATIONAL EQUIVALENT)] (**)

hereby certifies that it has performed an airworthiness review in accordance with the Civil Aviation Regulations on the following aircraft:

Aircraft manufacturer: ……Manufacturer's designation: ……
Aircraft registration: ……Aircraft serial number: ……
(and) is considered airworthy at the time of the review.
Date of issue: ..... Date of expiry: ……
Airframe flight hours (FH) at date of review (*): ……..
Signed: ..... Authorisation No (if applicable): ……..

==========

1st Extension: The aircraft complies with the conditions of point ML.A.901(c) of MCAR-Part-ML
Date of issue: ..... Date of expiry:
……
Airframe flight Hours (FH) at date of issue (*):
……
Signed: ..... Authorisation No:
……
Company name: ..... Approval reference:
……

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2nd Extension: The aircraft complies with the conditions of point ML.A.901(c) of MCAR-Part-ML
Date of issue: ..... Date of expiry:
……
Airframe flight hours (FH) at date of issue (*):
……
Signed: ..... Authorisation No:
……
Company name: ..... Approval reference:
……..

(*) except for balloons and airships

(**) The issuer of the Form can tailor it to his need by deleting the name, the certifying statement, the reference to the subject aircraft and the issuance details that are not relevant for his use.

DCA Form 15c, Issue 4

CHAPTER 3 — INITIAL AIRWORTHINESS

CS-31GB (INITIAL ISSUE)

SUBPART A — GENERAL

CS 31GB.1 Applicability

These Certification Specifications (SCs) are applicable to manned free balloons that derive their lift from gas being lighter than air.

CS 31GB.2 Definitions

Definition of terms used:

(a) The ‘envelope’ contains the medium which provides the lift.

(b) A ‘basket’ is the basket, seat frame or other means suspended beneath the envelope provided for the carriage of the balloon occupants.

(c) ‘Disposable ballast’ is the amount of ballast required to be available for flight path management.

(d) ‘Tethered flight’ is the temporary restraint of a free balloon whilst in flight for the purposes of conducting an entire flight at a single location.

(e) ‘Launch restraint’ is the temporary restraint of a free balloon for the purpose of initiating a free flight.

SUBPART B — FLIGHT

CS 31GB.12 Proof of compliance

Each requirement of this Subpart must be met at each mass within the range of loading conditions for which certification is requested. This must be shown by:

(a) tests upon a balloon of the type for which certification is requested or by calculations based on, and equal in accuracy to, the results of testing; and

(b) systematic investigation of each mass if compliance cannot be reasonably inferred from the masses investigated.

CS 31GB.14 Mass limits

The range of masses over which the balloon may be safely operated must be established and at least consists of:

(a) maximum mass

The maximum mass is the highest mass at which compliance with each applicable requirement of CS-31GB is shown. The maximum mass must be established so that it is not more than the least of:

(1) the maximum mass selected for the product;

(2) the design maximum mass, which is the highest mass at which each structural loading condition is shown; or

(3) the maximum mass at which compliance with each applicable flight requirement is shown.

(b) minimum mass

The minimum mass is the lowest mass at which compliance with each applicable flight requirement is shown.

Mass limitation information related to safe operation of the balloon must be included in the Flight Manual. (See CS 31GB.81(b)(2))

AMC 31GB.14(a) Mass limits

The maximum mass corresponds to the maximum buoyancy. The lift-producing medium is not part of the maximum mass.

AMC 31GB.14(b) Minimum mass

Minimum mass. The determination of the minimum mass should take into consideration that the controllability of the balloon might be affected by a low internal pressure at low mass.

At least the following should be demonstrated:

In landing configuration with minimum crew, untaut condition and already disposed minimum ballast, all controls (e.g. parachute, valve, rip panel, control lines, etc.) should have a positive performance and function easily and smoothly.

Note: An untaut condition is a flight with a ‘slack’ envelope and open appendix.

CS 31GB.16 Empty mass

The empty mass must be determined by weighing the balloon with installed equipment but without lifting gas.

AMC 31GB.16 Empty mass

The equipment and configuration that are included in the empty mass need to be specified. Refer also to AMC 31GB.81(b)(2).

CS 31GB.17 Performance: climb

The balloon at maximum mass must be capable of climbing at least 90 metres in the first minute from a start in equilibrium at ground level.

AMC 31GB.17 Performance: climb

The climb performance should be demonstrated by a test. The fully inflated balloon to maximum pressure appropriate to the conditions of the test should start from equilibrium at ground level. The climb performance should be met without excessive jettisoning of ballast.

CS 31GB.20 Controllability

The balloon must be safely controllable and manoeuvrable without requiring exceptional piloting skill. Associated operational limitations must be established and included in the Flight Manual. (See CS 31GB.81(b)(2)).

SUBPART C — STRUCTURE

CS 31GB.21 Loads

Strength requirements are specified in terms of:

(a) limit loads that are the maximum loads to be expected in service, taking into account the load factors of CS 31GB.23; and

(b) ultimate loads that are limit loads multiplied by factors of safety of CS 31GB.25.

CS 31GB.23 Load factor

Flight load factor. In determining limit loads, the load factor must be at least 1·4.

CS 31GB.25 Factors of safety

(a) A factor of safety must be used in the balloon design as provided in the table.

	Safety factor
Envelope	5·00
Suspension components (fibrous or non-metallic)	2·25
Suspension components (metallic)	1·50
Other	1·50

(b) The primary attachments of the envelope to the basket must be designed so that any single failure will not jeopardise safety of flight.

(c) For design purposes, an occupant mass of at least 77 kg must be assumed.

AMC 31GB.25 Factors of safety

The term ‘envelope’ here includes the integral vertical and horizontal load tapes as well as the envelope fabric(s). It should be noted that the suspension system pick-up points (sometimes known as ‘turnbacks’) at the envelope should be regarded as part of the suspension system, rather than the envelope, as far as 31GB.25 is concerned.

‘Suspension components’ here are those parts of the balloon that carry the load between the lift force of the envelope and the weight force of the basket.

A net around the envelope taking these loads or suspension system pick-up points should be considered as part of the suspension system.

The individual structural elements in the suspension system should be dimensioned and configured or duplicated so that failure or absence of one structural element does not cause any uncontrollable operating condition. The factors of safety apply to all parts of the load bearing path (e.g. joints, splices, knots, terminals, etc.).

The post-single failure case only needs to be justified with the application of limit loads.

CS 31GB.27 Strength and proof of strength

(a) The structure must be able to support limit loads without permanent deformations or other detrimental effects.

(b) The structure must be able to withstand ultimate loads for at least 3 seconds without failure.

(c) Proof of strength of the envelope material and other critical design features must be tested.

(d) The basket must be of a generally robust design and afford the occupants adequate protection during a hard or fast landing. There must be no design feature that by reasonably envisaged distortion or failure would be likely to cause serious injury to the occupants.

(e) Each item of mass that could cause an unsafe condition if it broke loose must be restrained under all loads up to the ultimate loads specified in this paragraph. The local attachments in the load path between the restrains and the structure should be designed to withstand 1.33 times the specified ultimate loads

Horizontal 6 g,

Downward 6 g,

Upward 2 g.

(f) The design and strength of components must also consider the effects of recurrent and other loads experienced during transportation, ground handling and rigging.

(g) The effect of temperature and other operating characteristics that may affect strength of the balloon must be accounted for.

AMC 31GB.27 Strength and proof of strength

Proof of compliance with the strength requirements must cover the balloon's entire operating range. Proof by calculation only can be accepted for designs where it has been demonstrated by experience that such calculation gives reliable results. Load tests need to be performed in all other cases.

AMC 31GB.27(c) Strength and proof of strength

The envelope tests may be performed on representative portions of the envelope provided the dimensions of these portions are sufficiently large to include critical design features and details such as critical seams, joints, load-attachment points, net mesh, etc. Also refer to CS 31GB.44 for specific tear propagation requirements.

AMC 31GB.27(d) Strength and proof of strength

A drop test needs to be performed if it is not possible to make use of an existing proven basket of the same or similar design (in terms of construction method, size, layout, etc.) for a balloon of the size that is the subject of the application. In the absence of an alternative test proposal, this test must be performed at the maximum design mass of the basket in a manner that simulates the effects of gravity that occur as realistically as possible. The basket is dropped onto a horizontal concrete surface from a height of 1 m at 0°, 15° and 30°. The drop test should not result in deformation or fractures which, by their nature, could lead to the serious injury of occupants.

Note: It has been shown by a number of decades of in-service experience that the traditional reinforced woven wicker and willow basket design offers a combination of resilience and impact resistance that can contribute considerably to the protection of occupants. The structure is also able to absorb considerable kinetic energy during impact on the ground or against obstacles.

AMC 31GB.27(e) Strength and proof of strength

Items of mass (e.g. batteries or equipment) inside the basket or attached to the suspension system near or above the occupants should be considered because of their risk to the occupants.

Items of mass that do not cause a risk to the occupants during a hard or fast landing, but could become detached from the balloon (e.g. ballast attached to the outside of the basket), should be considered because of the potential loss of mass.

AMC 31GB.27(f) Strength and proof of strength

The strength requirements need to include consideration of loads during transport, ground handling and rigging. The loads need to be determined and the parts and components need to be designed in accordance with their designated use and dimensioned such as not to fail under recurrent loads.

CS 31GB.28 Tethered flight loads

(a) The effects of the loads associated with tethered flight on the balloon's components and any additional equipment (if required) must be considered in the design.

(b) The tethered restraint system must be designed so that any single failure will not jeopardise the safety of the occupants, the balloon and or third parties.

(c) Operational limitations, associated to tethered flight, must be established and recorded in the Flight Manual. (See CS 31GB.81(b)(2))

AMC 31GB.28(a) Tethered Flight Loads

Due to the complexity of tethered flight loading, a simple analysis using configurations based on industry best practice (e.g. restraints/tether lines in a 'flat tripod' configuration with upwind and downwind v-bridles) can be used to determine the suitability of a design.

The structure needs to be designed so that stress concentrations beyond the limit of fatigue are avoided in areas where normal operation may produce varying stress.

Note: The greatest danger during tethering is if any element of the tethering equipment should fail with insufficient positive buoyancy for safe free flight. For this reason, a single point/single element tethering should not be considered.

CS 31GB.30 Restraint harness

(a) When an occupant restraint harness is installed, the harness must not fail when subjected to loads resulting from the occupant mass submitted to the following acceleration (See Figure 1):

(1) 2·0g Upwards

(2) 3·0g Horizontally in all directions.

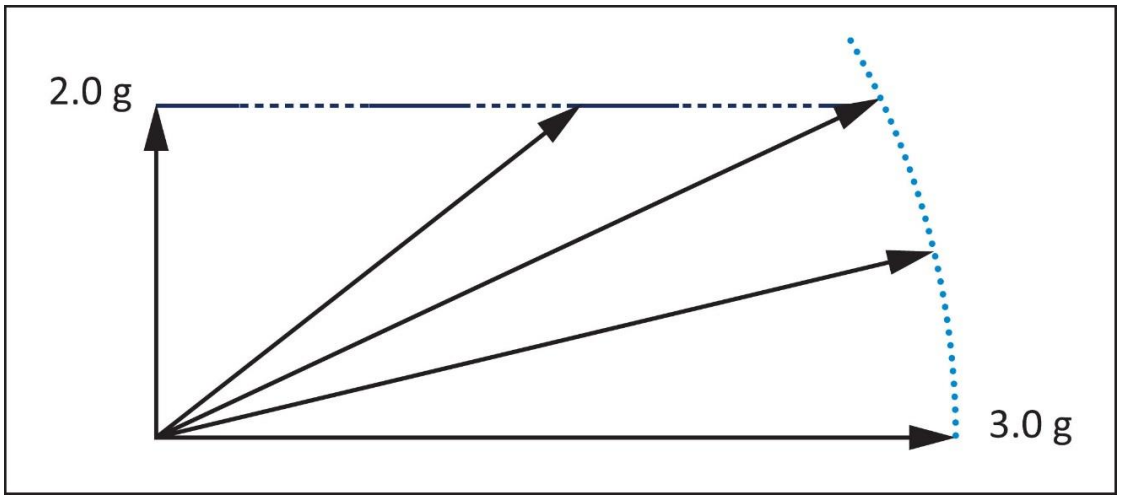


Figure 1: Restraint harness loads

An occupant mass of at least 86 kg must be assumed for the purposes of this paragraph.

(b) Local attachments in the load path between the safety belt or harness and the main structure of the basket, restraining the occupant, must be shown to be able to withstand the loads prescribed in CS 31GB.30(a) multiplied by a fitting factor of 1·33.

SUBPART D — DESIGN AND CONSTRUCTION

CS 31GB.31 General

The suitability of each design detail or part that bears on safety must be established by tests or analysis.

CS 31GB.33 Materials

The suitability and durability of materials used for parts, the failure of which could adversely affect safety, must:

(a) be established by experience or tests; and

(b) meet approved specifications that ensure that the materials have the strength and other properties assumed in the design data.

AMC 31GB.33(b) Materials

Approved specifications here should be taken as being those produced by the applicant or those meeting internationally recognised standards as defined applicable in the type design data. Material specifications should be those contained in documents accepted either specifically by the Authority or by having been prepared by an organisation or person which the Authority accepts has the necessary capabilities. In defining design properties, these material specification values should be modified and/or extended as necessary by the constructor to take account of manufacturing practices (for example method of construction, forming, machining and subsequent heat treatment). Also the effects of environmental conditions, such as temperature and humidity expected in service, need to be taken into account.

CS 31GB.35 Fabrication methods

The methods of fabrication used must produce a consistently sound structure. If a fabrication process requires close control to reach this objective, the process must be performed in accordance with an approved process specification.

AMC 31GB.35 Fabrication methods

Approved fabrication methods here should be taken as being those produced by the applicant or those meeting internationally recognised standards as defined in the applicable type design data. Fabrication methods should be those contained in documents accepted either specifically by the Authority or by having been prepared by an organisation or person which the Authority accepts has the necessary capabilities.

CS 31GB.37 Fasteners

(a) Fasteners (e.g. bolts, pins, screws, karabiners) used in the structure must conform to approved specifications.

(b) Locking methods must be established and documented.

(c) Unless a joint is free from relative movement, secondary locking means must be used.

(d) Self-locking nuts may not be used on bolts that are subject to rotation in service.

AMC 31GB.37(a) Fasteners

Approved specifications in the sense of these requirements are the standards described in the AMC 31GB.33(b).

CS 31GB.39 Protection of parts

Parts, the failure of which could adversely affect safety, must be suitably protected against deterioration or loss of strength in service due to weathering, corrosion, heat, abrasion, ground handling, ground transport, flight conditions or other causes.

AMC 31GB.39 Protection of parts

Suspension system cables and components manufactured from stainless steels (corrosion resistant steels) are considered compliant with this requirement.

To ensure the suitable protection of parts against deterioration or loss of strength, it is permissible to rely on instructions for continued airworthiness (e.g. recommended inspections or mandatory replacement of parts) (see also CS 31GB.82).

CS 31GB.41 Inspection provisions

There must be a means to allow close examination of each part that requires repeated inspection and adjustment.

CS 31GB.43 Fitting factor

(a) A fitting factor of at least 1·15 must be used in the analysis of each fitting if the strength is not proven by limit and ultimate load tests that simulate the actual stress conditions in the fitting and surrounding structure. This factor applies to all parts of the fitting, the means of attachment, and the bearing on the structural elements joined.

(b) Each part with an integral fitting must be treated as a fitting up to the point where the section properties become typical of the member.

(c) The fitting factor need not be used if the joint design is made in accordance with approved practices and the safety of which is based on comprehensive test data.

AMC 31GB.43(c) Fitting factors

Approved practices here should be taken as being those produced by the applicant or those meeting internationally recognised standards as defined in the applicable type design data. Approved practices should be those contained in documents accepted either specifically by the Authority or by having been prepared by an organisation or person which the Authority accepts has the necessary capabilities.

CS 31GB.44 Protection of envelope against tearing

The design of the envelope must be such that, while supporting limit load, local damage will not grow to an extent that results in uncontrolled flight or landing.

AMC 31GB.44 Protection of the envelope against tearing

Demonstration of sufficient rip-stopping capability of the envelope material.

The objective of this demonstration is to show that the envelope material is sufficiently damage resistant. It therefore needs to be determined at what tear size the envelope material would continue to tear under the maximum tension and conditions (temperature) experienced in normal operation. In this AMC this tear size is called the critical damage.

In order to establish that the determined damage resistance is sufficient, the critical damage should be reviewed in relation to local damage foreseeable in normal operation.

The local damages to be considered are:

- existing damage that may be undetected during pre-flight inspection, and
- limited damage, inflicted during flight where the size of the damage in itself would not result in a catastrophic failure (e.g. a limited damage caused by hitting a branch or other basket during take off).

The resistance of envelope fabric to damage propagation should be determined by a test.

Determine the critical damage to the envelope fabric at the maximum tension experienced in service. Critical damage is the maximum damage at which growth does not occur.

Damages to be considered are:

- a slit in the most unfavourable direction;

- a crosswise slit in the most unfavourable directions.

Test requirements

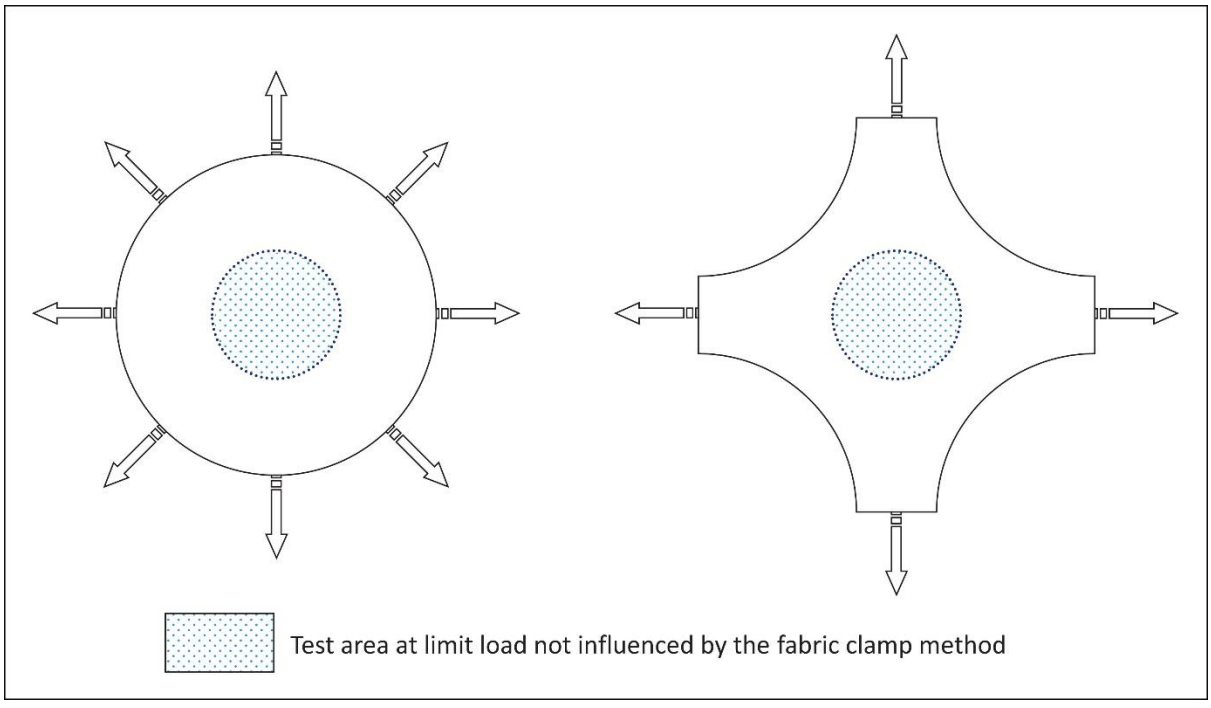
The envelope fabric should be tested at maximum tension experienced in service. The effects of temperature on the material properties must be taken into account.

The tension in the test area of the specimen of the fabric should be equal to the maximum tension experienced in service and the test method should not create unacceptable tension re-distributions in the test area when the test is conducted.

A step-wise increase of the damage (e.g. a cut with a sharp knife) should be used to determine the critical damage size.

Between the step-wise increase of the damage, enough time should be permitted for the tension re-distribution at the damage location.

The critical damage length of the material should be recorded.



Examples of a circular or 2-directional test set-up

Pre-flight inspection requirements

The design of the envelope and pre-flight inspection method should be such that a damage length considerably smaller than the critical damage length will be discovered during a pre-flight inspection. The impact of aging and operating circumstances should be considered when establishing the margin between critical damage and detectable damage. (Refer to CS 31GB.27(g))

Design features that could possibly hinder discovery of damage during a pre-flight inspection should be avoided or taken into consideration when the detectable damage size is determined.

Note 1: It is assumed that an envelope damage exceeding 5 cm will be detected before flight due to the loss of gas.

Note 2: The critical damage is a design property that should not be confused with acceptable damage as provided in the flight manual.

CS 31GB.49 Control systems

(a) Each control must operate easily, smoothly, and positively enough to allow proper performance of its functions. Controls must be so arranged and identified to prevent confusion and inadvertent operation.

(b) Each control system and operating device must be designed and installed in a manner that will prevent jamming, chafing, or unintended interference from passengers or loose items of equipment. The elements of the control system must have design features or must be distinctly and permanently marked to minimise the possibility of incorrect assembly that could result in malfunctioning of the control system.

(c) The envelope must be protected against bursting using a valve or appendix.

(d) There must be a valve to control the flight of the balloon. Proof of its reliable operation must be provided.

AMC 31GB.49(c) Control systems

The envelope is protected against bursting when it is equipped with an appendix or valve that can automatically release gas at the rate of at least 3% of the total volume per minute at the balloon's maximum operating pressure. The appendix or valve should be designed to prevent possible blockage during flight due to e.g. freezing, jamming or a reduction of the outflow opening due to deflection of the envelope and/or the outflow opening.

CS 31GB.51 Disposable ballast

(a) Disposable ballast must have means for safe storage and release. (See also CS 31GB.27(e))

(b) A minimum amount of ballast must be defined and reserved for the final landing which is sufficient (when jettisoned) to reduce the speed of descent to an acceptable value. The minimum ballast must be provided in the Flight Manual. (See CS 31GB.81(b)(2))

AMC 31GB.51 Disposable Ballast

Ballast material should be easily transferred, disposed of and dissipated. Means need to be provided to prevent freezing and/or blocking the release of the ballast material. The material should not pollute the environment.

Dry sand is a well-proven material and is considered as suitable in the sense of this paragraph and this AMC.

The disposable ballast may be necessary for the pilot to perform the flight path management. The pre-take-off decision on the amount of disposable ballast should be left to the pilot as it is dependent on the flight task, the weather, etc.

A minimum ballast quantity is considered sufficient if, when jettisoned, it stops a descent speed of 4 m/s.

Note: The shape and drag of the envelope can have an effect on minimum descent speed, resulting in a minimum descent speed above 4 m/s.

CS 31GB.53 Drag rope

If a drag rope is used, the end that is released overboard must be stiffened to preclude the probability of the rope becoming entangled with trees, wires, or other objects on the ground.

CS 31GB.55 Rapid deflation means

(a) The envelope must have means to allow for rapid deflation after landing. The system must be designed to minimise the possibility of inadvertent operation. If a system other than a manual system is used, the reliability of the system used must be substantiated.

(b) If a balloon is equipped with a lateral rapid deflation means, a device must be installed to align the balloon during landing in order to turn the rapid deflation means into its designated position.

AMC 31GB.55(a) Rapid deflation means

A deflation is considered as ‘rapid’ if after a touchdown the balloon envelope is adequately prevented from ‘sailing’ and being dragged too much over the ground by the wind.

AMC 31GB.55(b) Rapid deflation means

The installation of a drag rope is considered as a suitable device to align the balloon during landing in the sense of this subparagraph.

CS 31GB.57 Control cords

(a) General

(1) All control cords used for flight control must be designed and installed to preclude entanglement.

(2) The function of control cords should be identified to the pilot and marked in accordance with paragraph (b), (c) and (d) if applicable.

(3) The maximum force required for their operation must not exceed 340 N.

(4) All control cords used for flight control must be long enough to allow for an increase of at least 10% in the vertical dimension of the envelope.

(b) Arming cords

If an arming device is employed to prevent inadvertent operation of an irreversible control, the part of the cord to be handled by the pilot must be coloured with yellow and black bands.

(c) Venting cords

(1) If a venting cord is used to allow controlled release of the lifting gas and the vent can be resealed in flight, the part of the cord to be handled by the pilot must be coloured with red and white bands.

(2) If a further cord is required to reseal any vent, the part of the cord handled by the pilot must be coloured white.

(d) Rapid or emergency deflation cords

(1) If a cord is used for rapid or emergency deflation of the envelope and the device cannot be resealed in flight, the part of the cord to be handled by the pilot must be coloured red.

(2) In addition to the force requirement of 31GB.57(a)(3) above, the force required to operate an emergency deflation cord must not be less than 110 N.

CS 31GB.59 Baskets

(a) The basket may not rotate independently of the envelope unless:

(1) the rotation is under control of the pilot; and

(2) entanglement of operating lines is prevented.

(b) Each projecting object on the basket, that could cause injury to the occupants, must be padded.

(c) Occupants of a basket must be protected during hard or fast landings against:

(1) falling from the basket;

(2) serious injuries.

(d) When more than six occupants are carried, the basket must be divided into compartments, each containing not more than six occupants.

(e) Where basket proportions and compartmentation are such that more than one occupant may fall on top of another during landing, there must be means to minimise this possibility.

(f) Reasonable space must be provided for all occupants, with regard to both comfort during the flight and to safety during the landing.

(g) The space for the pilot must provide unobstructed operation in all flight phases.

(h) There must be hand holds for each occupant.

(i) Means must be provided to allow drainage of vapour or liquid from the bottom of the basket.

(j) The load-bearing parts (e.g. ropes or cables) of the suspension system must be protected against damage in normal service.

(k) The basket floor must not project beyond the sidewalls.

(l) Limitations on the occupancy and configuration of the basket must be provided in the Flight Manual. (See CS 31GB.81).

AMC 31GB.59(a) Baskets

The purpose of this subparagraph is to prevent entanglement of operating lines due to uncontrolled rotation.

It should be noted that uncontrolled rotation may also occur during landings with basket tip-over if the plan view of the basket floor is circular or more than hexagonal.

AMC 31GB.59(c) Baskets

An internal height of the basket of 1·10 m, protecting the occupants carried from falling from the basket, is considered compliant to this requirement.

AMC 31GB.59(e) Baskets

Alignment of the basket for landing using a drag rope or an equivalent feature and Flight Manual instructions specifying that the basket should be aligned to land on one of its longer sides can be used to show compliance to this requirement. No more than

two occupants may be positioned in the landing direction without means to prevent them from falling on top of each other.

AMC 31GB.59(f) Baskets

Unless otherwise justified on safety grounds, a minimum figure of between 0·25 m² and 0·3 m² plan area should be used for each standing occupant, with proper account being taken of the specified size, number and position of equipment when applying this figure. There needs to be enough space provided for passengers to take a brace position for landing. The Authority should be consulted in cases where a basket's shape or compartmentation makes the measurement of this figure subjective.

AMC 31GB.59(h) Baskets

Handholds need to be provided as an obvious means for the occupants to safely hold on to during a landing. The location or design of the handholds need to provide protection of the hands from impact during a landing.

AMC 31GB.59(l) Baskets

These limitations should state, for each permissible model of basket or other means provided for the occupants, the maximum permitted occupancy in relation to specified sizes, numbers and positions of equipment items.

CS 31GB.61 Electrostatic discharge

There must be appropriate electrostatic discharge means in the design of each balloon whose lift-producing medium contains a flammable gas to ensure that the effects of electrostatic discharge will not create a hazard.

AMC 31GB.61 Electrostatic discharge

Appropriate electrostatic discharge means are met when compliance with all of the following requirements is demonstrated.

(a) The surface resistance on the inside of the balloon envelope after 24-hour storage at a relative air humidity of less than 50% must be value 109 Ω or lower. The values are to be determined using approved measuring methods.

(b) The respective layer of a non-conductive material (surface resistance in excess of 109 Ω) must not be thicker than 0.3 mm unless it is enclosed by conductive layers.

(c) The balloon envelope and all other conductive parts of the balloon (surface resistance less than 109 Ω) must be conductively connected to each other (resistance of connection less than 106 Ω). This requirement also applies to the joints between the panels and reinforcements.

(d) There must be at least three independent discharge paths for the safe balance of the electrostatic charges from the inside of the envelope running to the bottom end of the basket.

(e) The discharge paths should run on the conductive side of the envelope from top to bottom and then further down to the ground. This requirement applies to the case when the balloon is in contact with earth's surface.

(f) Each discharge path under (d) must be of different kind or design to the other.

(g) Periodic maintenance checks of the surface resistance and discharge paths should be included in the instructions for continued airworthiness.

Note: More detailed information can be found in:

EN 61340-5-1&2:2007 Protection of electronic devices from electrostatic phenomena – General Requirements & User guide

IEC 60093 Methods of Test for Volume Resistivity and Surface Resistivity of Solid Electrical Insulating Materials

CS 31GB.63 Occupant restraint

(a) There must be a restraining means for all occupants, which can take the form of hand holds. (See CS 31GB.59(h))

(b) For baskets having a separate pilot compartment, there must be a suitable restraint for the pilot which must meet the strength requirements of CS 31GB.30. Additionally, the restraint must be designed so that:

(1) the pilot can reach all the necessary controls when the restraint is correctly worn and adjusted;

(2) there is a method of quick release that is simple and obvious; and

(3) the possibility of inadvertent release is minimised.

CS 31GB.67 Tethered flight

The pilot must be provided with an indication that any applicable limitations for tethered flight are being, or have been reached.

AMC 31GB.67 Tethered flight

The inclusion of an appropriate device or instrument (rated 'weak link', hand held anemometer, windsock, etc.) to provide the pilot with an attention-getting indication of the balloon's tethering limitation, is considered compliant with CS 31GB.67.

(SUBPART E — NOT APPLICABLE)

SUBPART F — EQUIPMENT

CS 31GB.71 Function and installation

(a) Each item of required equipment must:

(1) be of a kind and design appropriate to its intended function;

(2) be labelled or marked to identify its function or operating limitations, or any applicable combination of these factors;

(3) be installed according to limitations specified for that equipment; and

(4) function properly when installed.

(b) Instruments and other equipment may not in themselves, or by their effect upon the balloon, constitute a hazard to safe operation. (See also CS 31GB.27(e))

AMC 31GB.71(a)(4) Function and installation

The correct functioning should not be impaired by operational circumstances such as icing, heavy rain, high humidity or low and high temperatures. The equipment, systems, and installations need to be designed to prevent hazards to the balloon in the event of a probable malfunction or failure of that equipment.

When ATC equipment and/or positioning lights as possibly required by operational rules are installed, it should be shown that the electrical system is such that the operation of this equipment is not adversely affected.

CS 31GB.72 Miscellaneous equipment

Each balloon must be equipped with a rate of climb/descent indicator (variometer).

SUBPART G — OPERATING LIMITATIONS AND INFORMATION

CS 31GB.81 Operating instructions

(a) Operating instructions must be furnished in a Flight Manual with each balloon.

(b) The Flight Manual must contain:

(1) a description of the balloon and its technical equipment with explanatory sketches;

(2) operating limitations, normal procedures (including rigging, inflation, deflation and tethered flight (if applicable)), emergency procedures, and other relevant information specific to the balloon's operating characteristics and necessary for safe operation. This section of the manual requires approval;

(3) specification of the permissible lifting gas;

(4) information for ground handling, transport and storage.

(c) The operating limitations, normal and emergency procedures, and other relevant information specific to the balloon's operating characteristics and necessary for safe operation must be provided to the pilot.

AMC 31GB.81 Operating instructions

(a) It is recommended that the Specimen Flight Manual of CS-22 (AMC 22.1581) be used as guidance in the creation of a Balloon Flight Manual.

(b) Each part of the Flight Manual that is required to be approved needs to be segregated, identified and clearly distinguished from each unapproved part of that manual.

(c) A comprehensive list of approved basket and envelope configurations needs to be provided for each balloon model to enable operators, inspectors, etc. to easily establish an item's acceptability.

(d) If applicable, the operating limitations, normal and emergency procedures need to include procedures and limitations for tethered flight. These procedures and limitations need to include:

(1) site selection, layout and assembly,

(2) the maximum wind speed and meteorological conditions for tethered operation,

(3) the MTOM (if different from free flight),

(4) the maximum height of the tether,

(5) the minimum strength of ropes, rigging, etc.,

(6) limitations on occupancy (if applicable).

AMC 31GB.81(b)(2) Operating instructions

The operating procedures should contain instructions necessary for the safe operation of the balloon. In particular, mitigating measures for risks of that specific type of balloon should be included. Examples are safety instructions for flying, filling or deflating envelopes using a flammable or poisonous gas as lifting gas.

Operating procedures need to provide empty mass information required by CS 31GB.16 in an unambiguous manner that will allow the verification of the balloon's mass limitations before flight.

AMC 31GB.81(c) Operating instructions

The operating limitations, normal and emergency procedures need to be available to the pilot during operation by providing the specific sections of the flight manual or by other means (e.g. placards, quick reference cards) that effectively accomplish the purpose.

CS 31GB.82 Instructions for continued airworthiness

(a) The instructions for Continued Airworthiness must include information essential to the Continued Airworthiness of all parts and appliances of the balloon as required by CS-31GB.

(b) The instructions for Continued Airworthiness must be in the form of a manual or manuals as appropriate for the quantity of data provided.

(c) The format of the manual or manuals must provide for a practical arrangement.

(d) The instructions for Continued Airworthiness must cover:

(1) detailed description of the balloon and its components, systems and installations;

(2) handling instructions;

(3) basic control and operating information describing how the balloon's components, systems and installations operate;

(4) servicing information;

(5) a maintenance schedule against which the balloon must be inspected and maintained;

(6) maintenance and inspection instructions;

(7) repair instructions;

(8) trouble-shooting information;

(9) airworthiness limitations that set forth each mandatory replacement time, inspection interval and related inspection procedure. This section of the manual requires approval.

AMC 31GB.82 Instructions for continued airworthiness

The paragraph numbering of this AMC relates to the paragraph numbering of CS 31GB.82

(c) If instructions for continued airworthiness are not supplied by the manufacturer or designer of parts and appliances installed in the balloon, the instructions for continued airworthiness for the balloon need to include the information essential to the continued airworthiness of the balloon.

If manuals from different manufacturers are used, they need to provide a practical arrangement.

(d)(1) The detailed description of the balloon and its components needs to include for each balloon:

- a description of the systems including the assembly and disassembly instructions;
- a parts list covering all construction and equipment components and the assemblies. Where applicable, individual parts need to be numbered so that they can be related to the different assemblies and that their number corresponds to the type plate of the assembly;
- a summary of the materials and consumables used with procurement details.

(d)(5) If applicable, the maintenance schedule may include instructions for continued airworthiness (e.g. recommended inspections or mandatory replacement of parts) to ensure the suitable protection of parts against deterioration or loss of strength, objective pass or fail criteria, e.g. applicable wear tolerances need to be provided.

(d)(6) The maintenance and inspection instructions need to provide information for removal and installation, cleaning, inspecting, adjusting, testing and lubrication of systems, parts and appliances of the balloon as required for continued airworthiness. Reference may be made to information from an accessory, instrument or equipment manufacturer as the source of this information if it is shown that the item has an exceptionally high degree of complexity requiring specialised maintenance techniques, test equipment or expertise.

(d)(9) If the instructions for continued airworthiness consist of multiple documents, the Airworthiness Limitations section need to be included in the principal manual.

CS-31HB (AMENDMENT 1)

SUBPART A – GENERAL

CS 31HB.1 Applicability

These Certification Specifications (CSs) are applicable to manned free balloons that derive their lift from:

(a) heated air (Hot Air Balloons)

(b) a combination of heated air and a non flammable gas being lighter than air (Mixed Balloons, also called Rozière).

[Amdt No.: 31HB/1]

CS 31HB.2 Definitions

Definition of terms used:

(a) The 'envelope' contains the medium which provides the lift.

(b) A 'basket' is the basket, seat frame or other means suspended beneath the envelope for the carriage of the balloon occupants.

(c) A 'Heater System' is the system used to heat the air to provide the lifting means of the balloon. The system includes the heat source (e.g. burner), controls, fuel lines, fuel cells, regulator, control valves and other related elements.

(d) 'Disposable Ballast' is the amount of ballast required to be available for flight path management.

(e) 'Tethered Flight' is the temporary restraint of a free balloon whilst in flight for the purposes of conducting an entire flight at a single location.

(f) 'Launch Restraint' is the temporary restraint of a free balloon for the purpose of initiating a free flight.

[Amdt No.: 31HB/1]

SUBPART B – FLIGHT

CS 31HB.12 Proof of compliance

Each requirement of this Subpart must be met at each mass within the range of loading conditions for which certification is requested. This must be shown by:

(a) Tests upon a balloon of the type for which certification is requested or by calculations based on, and equal in accuracy to, the results of testing; and

(b) Systematic investigation of each mass if compliance cannot be reasonably inferred from the masses investigated.

CS 31HB.14 Mass limits

The range of masses over which the balloon may be safely operated must be established and at least consists of:

(a) Maximum mass.

The maximum mass is the highest mass at which compliance with each applicable requirement of CS-31HB is shown. The maximum mass must be established so that it is not more than the least of: (See AMC 31HB.14(a))

(1) The maximum mass selected for the product;

(2) The design maximum mass, which is the highest mass at which each structural loading condition is shown; or

(3) The maximum mass at which compliance with each applicable flight requirement is shown.

(b) Minimum mass.

The minimum mass is the lowest mass at which compliance with each applicable flight requirement is shown. (See AMC 31HB.14(b))

Mass limitations between which the balloon may be safely operated must be included in the Flight Manual. (See CS 31HB.81(b)(2))

AMC 31HB.14(a) Mass limits

The maximum mass corresponds to the maximum buoyancy. The lift-producing medium is not part of the maximum mass.

AMC 31HB.14(b) Mass limits

Minimum mass: In arriving at this figure, especially with larger balloons, attention should be paid to the ability to properly operate the balloon, in terms of both its heating and venting, with the reduced envelope rigidity associated with low mass operation.

CS 31HB.16 Empty mass

The empty mass must be determined by weighing the balloon with installed equipment but without lifting gas. (See AMC 31HB.16)

AMC 31HB.16 Empty mass

The equipment and configuration that is included in the empty mass should be specified. Refer also to AMC 31HB.81(b)(2).

CS 31HB.17 Performance: climb

The balloon must be capable of climbing at least 90 metres in the first minute from a start in equilibrium at ground level. Compliance must be shown at the maximum mass appropriate to the conditions of the test. (See AMC 31HB.17)

AMC 31HB.17 Performance: climb

"Conditions of the test" here refers to the combination of launch field elevation (launch altitude) and corresponding ambient air temperature. The test should be conducted at minimum specified burner fuel pressure.

CS 31HB.20 Controllability

The balloon must be safely controllable and manoeuvrable without requiring exceptional piloting skill. Associated operational limitations must be established and included in the Flight Manual. (See CS 31HB.81(b)(2))

SUBPART C – STRUCTURE

CS 31HB.21 Loads

Strength requirements are specified in terms of:

(a) limit loads that are the maximum loads to be expected in service, taking into account the load factors of CS 31HB.23 and

(b) ultimate loads that are limit loads multiplied by factors of safety of CS 31HB.25.

CS 31HB.23 Load factors

(a) Flight load factor. In determining limit loads, the limit load factor must be at least 1·4, except for (b).

(b) Landing load factor. For all parts belonging to the balloon's suspension system, including the envelope to suspension system pick up points, limit load must be determined using a limit load factor of at least 3·0.

CS 31HB.25 Factors of safety

(a) A factor of safety must be used in the balloon design as provided in the table.

	Safety factor
Envelope	5.00
Suspension components (fibrous or non-metallic)	2.25
Suspension components (metallic)	1.50
Other	1.50

(b) A reduced factor of 2 or more may be used in the envelope design if it is shown that the selected factor will preclude failure due to creep or instantaneous rupture from lack of rip stoppers. The selected factor must be applied to the more critical of the maximum operating pressure or envelope stress.

(c) The primary attachments of the envelope to the basket must be designed so that any single failure will not jeopardise safety of flight.

(d) For design purposes, an occupant mass of at least 77 kg must be assumed.

[Amdt No.: 31HB/1]

AMC 31HB.25 Factors of safety

The term "envelope" here includes the integral vertical and horizontal load tapes as well as the envelope fabric(s). It should be noted that the envelope to suspension system pick-up points (sometimes known as 'turnbacks') should be regarded as part

of the suspension system, rather than the envelope, as far as CS 31HB.25 is concerned.

"Suspension components" here are those components, from the base of the envelope down, upon which form the primary load paths of the trapeze, basket or other means provided for the occupants.

The individual structural elements in the suspension system should be dimensioned and configured or duplicated so that failure of one structural element (single failure) does not cause any uncontrollable operating condition. The factors of safety apply to all parts of the load bearing path (e.g. joints, splices, knots, terminals etc).

The post-single failure case should be justified with the application of limit loads.

[Amdt No.: 31HB/1]

CS 31HB.27 Strength and proof of strength

(a) The structure must be able to support limit loads without permanent deformations or other detrimental effects.

(b) The structure must be able to withstand ultimate loads for at least 3 seconds without failure.

(c) For the balloon envelope, proof of strength must also make allowance for tear growth after damage of the envelope in order to prevent propagation of a tear to a hazardous size. (See AMC 31HB.27(c))

(d) The basket must be of a generally robust design and afford the occupants adequate protection during a hard or fast landing. There must be no design feature that by reasonably envisaged distortion or failure would be likely to cause serious injury to the occupants. (See AMC 31HB.27(d))

(e) The design and strength of components (particularly the burner frame/load frame) must also consider the effects of recurrent and other loads experienced during ground handling and transportation. (See AMC 31HB.27(e))

(f) The effect of temperature and other operating characteristics that may affect strength of the balloon must be accounted for.

(g) Each item of mass that could cause an unsafe condition if it broke loose must be restrained under all loads up to the ultimate loads specified in this paragraph. The local attachments in the load path between the restrains and the structure should be designed to withstand 1.33 times the specified ultimate loads (See AMC 31HB.27(g)):

- Horizontal 6.0g,
- Downward 6.0g,
- Upward 2.0g.

[Amdt No.: 31HB/1]

AMC 31HB.27 Strength and proof of strength

Proof of compliance with the strength requirements should cover the balloon's entire operating range. Proof by calculation only can be accepted for designs where it has been demonstrated by experience that such calculation gives reliable results. Load tests should be performed in all other cases.

AMC 31HB.27(c) Strength and proof of strength

For the envelope tests may be performed on representative portions of the envelope provided the dimensions of these portions are sufficiently large to include critical design features and details such as critical seams, joints, load-attachment points, etc.

AMC 31HB.27(d) Strength and proof of strength

A drop test should be performed if it is not possible to make use of an existing proven basket of the same or similar design (in terms of construction method, size, layout etc.) for a balloon of the size that is the subject of the application. In the absence of an alternative test proposal, this test should be performed at the maximum design mass of the basket in a manner that simulates the effects of gravity that occur as realistically as possible. The basket is dropped onto a horizontal concrete surface from a height of 1 m at 0°, 15° and 30°. The drop test should not result in deformation or fractures which, by their nature, could lead to the serious injury of occupants.

Note: It has been shown by a number of decades of in-service experience that the traditional reinforced woven wicker and willow basket design offers a combination of resilience and impact resistance that can contribute considerably to the protection of occupants. The structure is also able to absorb considerable kinetic energy during impact on the ground or against obstacles.

AMC 31HB.27(e) Strength and proof of strength

The strength requirements should include consideration of the ground handling case. The loads occurring in service should be determined and the parts and components under particular stress should be designed in accordance with their designated use and dimensioned such as not to fail under recurrent loads.

AMC 31HB.27(g) Strength and proof of strength

This requirement for items of mass does not apply to fuel cells that are subject to specific requirements in CS 31HB.45(c)

Items of mass (e.g. batteries or equipment) inside the basket or attached to the suspension system near or above the occupants should be considered because of their risk to the occupants.

Items of mass that do not cause a risk to the occupants during a hard or fast landing, but could become detached from the balloon (e.g. ballast attached to the outside of the basket in case of a mixed balloon), should be considered because of the potential loss of mass.

[Amdt No.: 31HB/1]

CS 31HB.28 Tethered flight loads

(a) The effects of the loads associated with tethered flight on the balloon's components (particularly the burner frame/load frame) and any additional equipment (if required) must be considered in the design. (See AMC 31HB.28(a))

(b) The tethered restraint system must be designed so that any single failure will not jeopardise the safety of the occupants, the balloon and or third parties.

(c) The landing load factor and factor of safety for suspension components must be used for tethering-specific components forming part of the primary load path (e.g. forged rings, v-bridles). (See AMC 31HB.28(c))

(d) Operational limitations, associated to tethered flight, must be established and recorded in the Flight Manual. (See CS 31HB.81(b)(2))

AMC 31HB.28(a) Tethered flight loads

Due to the complexity of tethered flight loading, a simple analysis using configurations based on industry best practice (e.g. 'restraints/tether lines in a "flat tripod" configuration with upwind and downwind v-bridles) can be used to determine the suitability of a design.

Note: The greatest danger during tethering is if any element of the tethering equipment should fail with insufficient positive buoyancy for safe free flight. For this reason single point/single element tethering should not be considered.

AMC 31HB.28(c) Tethered flight loads

An appropriate factor of safety is CS 31HB.25(a) for metallic components or CS 31HB.25(c) for non-metallic or fibrous suspension components.

CS 31HB.30 Restraint harness

(a) When an occupant restraint harness is installed, the harness must not fail when subjected to loads resulting from the occupant mass submitted to the following acceleration (See Figure 1):

(1) 2.0g Upwards

(2) 3.0g Horizontally in all directions.

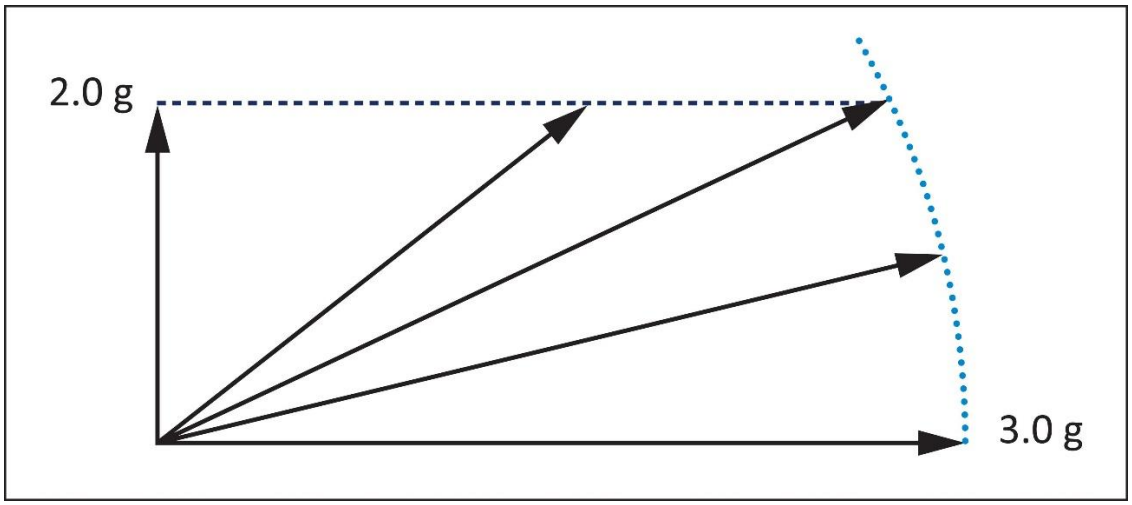


Figure 1 Restraint harness loads

An occupant mass of at least 86 kg must be assumed for the purposes of this paragraph.

(b) Local attachments in the load path between the safety belt or harness and the main structure of the basket, restraining the occupant, must be shown to be able to withstand the loads prescribed in CS 31HB.30(a) multiplied by a fitting factor of 1.33.¬

SUBPART D – DESIGN AND CONSTRUCTION

CS 31HB.31 General

The suitability of each design detail or part that bears on safety must be established by tests or analysis.

CS 31HB.33 Materials

(a) The suitability and durability of materials used for parts, the failure of which could adversely affect safety, must

(1) be established by experience or tests; and

(2) meet approved specifications that ensure their having the strength and other properties assumed in the design data. (See AMC 31HB.33(a)(2))

(b) Envelope materials must be shown not to support continued burning if ignited by the heater when the balloon is inflated or in flight.

AMC 31HB.33(a)(2) Materials

Approved specifications here should be taken as being those produced by the applicant or those meeting internationally recognised standards as defined applicable in the type design data. Material specifications should be those contained in documents accepted either specifically by the Authority or by having been prepared by an organisation or person which the Authority accepts has the necessary capabilities. In defining design properties these material specification values should be modified and/or extended as necessary by the constructor to take account of manufacturing practices (for example method of construction, forming, machining and subsequent heat treatment). Also the effects of environmental conditions, such as temperature and humidity, expected in service should be taken into account.

CS 31HB.35 Fabrication methods

The methods of fabrication used must produce a consistently sound structure. If a fabrication process requires close control to reach this objective, the process must be performed in accordance with an approved process specification. (See AMC 31HB.35)

AMC 31HB.35 Fabrication methods

Approved fabrication methods here should be taken as being those produced by the applicant or those meeting internationally recognised standards as defined in the applicable type design data. Fabrication methods should be those contained in documents accepted either specifically by the Authority or by having been prepared

by an organisation or person which the Authority accepts has the necessary capabilities.

CS 31HB.37 Fasteners

(a) Fasteners (e.g. bolts, pins, screws, karabiners, fuel cell straps) used in the structure must conform to approved specifications. (See AMC 31HB.37)

(b) Locking methods must be established and documented.

(c) Unless a joint is free from relative movement, secondary locking means must be used.

(d) Self-locking nuts may not be used on bolts that are subject to rotation in service.

AMC 31HB.37 Fasteners

Approved specifications in the sense of these requirements are the standards described in the AMC 31HB.33(a).

CS 31HB.39 Protection of parts

Parts the failure of which could adversely affect safety must be suitably protected against deterioration or loss of strength in service due to weathering, corrosion, heat, abrasion, ground handling, ground transport, flight conditions or other causes. (See AMC 31HB.39)

AMC 31HB.39 Protection of parts

Suspension system cables and components manufactured from stainless steels (corrosion resistant steels) are considered compliant with this requirement.

To ensure the suitable protection of parts against deterioration or loss of strength, it is permissible to rely on instructions for continued airworthiness (e.g. recommended inspections or mandatory replacement of parts) (See also CS 31HB.82).

CS 31HB.41 Inspection provisions

There must be a means to allow close examination of each part that requires repeated inspection and adjustment.

CS 31HB.43 Fitting factor

(a) A fitting factor of at least 1·15 must be used in the analysis of each fitting the strength of which is not proven by limit and ultimate load tests in which the actual stress conditions are simulated in the fitting and surrounding structure.

This factor applies to all parts of the fitting, the means of attachment, and the bearing on the structural elements joined.

(b) Each part with an integral fitting must be treated as a fitting up to the point where the section properties become typical of the member.

(c) The fitting factor need not be used if the joint design is made in accordance with approved practices and the safety of which is based on comprehensive test data. (See AMC 31HB.43(c))

AMC 31HB.43(c) Fitting factors

Approved practices here should be taken as being those produced by the applicant or those meeting internationally recognised standards as defined in the applicable type design data. Approved practices should be those contained in documents accepted either specifically by the Authority or by having been prepared by an organisation or person which the Authority accepts has the necessary capabilities.

CS 31HB.44 Protection of envelope against tearing

The design of the envelope must be such that, while supporting limit load, local damage will not grow to an extent that results in uncontrolled flight or landing.

[Amdt No.: 31HB/1]

AMC 31HB.44 Protection of envelope against tearing

Unless it can be demonstrated that basic envelope fabric has sufficient rip-stopping capability, horizontal and vertical load tapes and/or other rip-stoppers should be incorporated into the structure of the envelope so that likely tear lengths are limited to those for which level flight can be maintained. Failure of the envelope between rip-stoppers should be taken into account in the proof of the structure.

Demonstration of sufficient rip-stopping capability of the envelope fabric.

The objective of this demonstration is to show that the envelope fabric is sufficiently damage resistant. It therefore needs to be determined at what tear size the envelope fabric would continue to tear under the maximum tension and conditions (Temperature) experienced in normal operation. In this AMC this tear size is called the critical damage.

In order to establish that the determined damage resistance is sufficient, the critical damage should be reviewed in relation to local damage foreseeable in normal operation. The local damages to be considered are:

- Existing damage that may be undetected during pre-flight inspection, and

- Limited damage, inflicted during flight where the size of the damage in itself would not result in a catastrophic failure. (e.g. a limited damage caused by hitting a branch or other basket during take off)

  The resistance of envelope fabric to damage propagation should be determined by test.

  Determine the critical damage to the envelope fabric at the maximum tension experienced in service. Critical damage is the maximum damage at which growth does not occur.

Damages to be considered are:

- A slit in the most unfavourable direction;
- A crosswise slit in the most unfavourable directions.

Test requirements

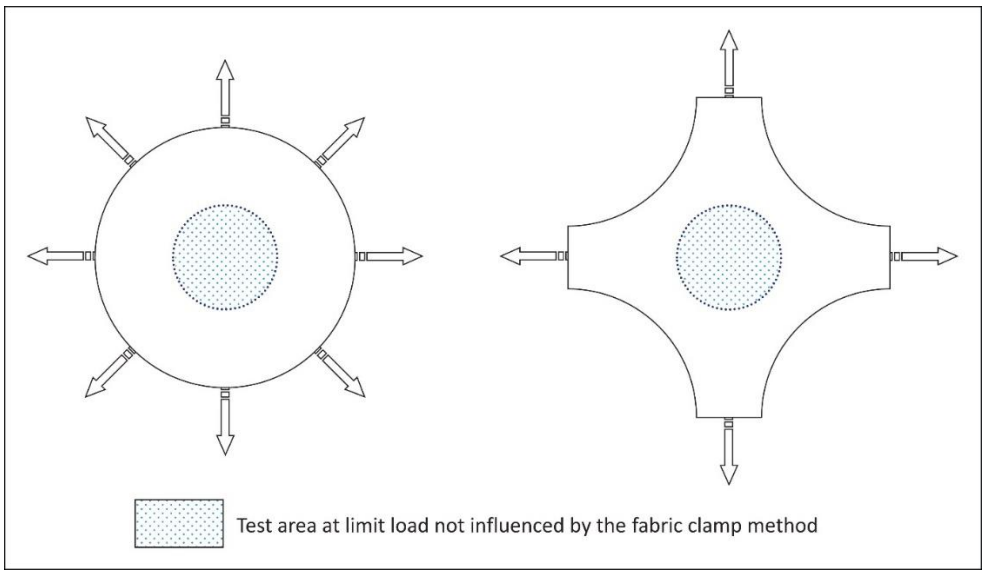
The envelope fabric should be tested at maximum tension experienced in service. The effects of temperature on the material properties must be taken into account.

The tension in the test area of the specimen of the fabric should be equal to the maximum tension experienced in service and the test method should not create unacceptable tension re-distributions in the test area when the test is conducted.

A step-wise increase of the damage (e.g. a cut with a sharp knife) should be used to determine the critical damage size.

Between the step-wise increases of the damage, enough time should be permitted for the tension re-distribution at the damage location.

The critical damage length of the material should be recorded.



Examples of a circular or 2-directional test set-up.

Pre-flight inspection requirements

The design of the envelope and pre-flight Inspection method should be such that visible damage considerably smaller in length than the critical damage length can be detected during a pre-flight inspection. The impact of ageing and operating circumstances should be considered when establishing the margin between critical damage and detectable damage length (refer to CS 31HB.27(f)).

Design features that could possibly hinder detection of damage during a pre-flight inspection should be avoided or taken into consideration when the detectable damage length is determined.

Note 1: It is assumed that a visual pre-flight inspection will detect damage above 10 cm.

Note 2: The critical damage is a design property that should not be confused with acceptable damage as provided in the flight manual.

[Amdt No.: 31HB/1]

CS 31HB.45 Fuel cells

(a) It must be demonstrated by test or analysis or both that fuel cell's have sufficient strength margins to withstand all conditions of internal and external pressures, temperatures and loads likely to be encountered in operation, including during ground handling and ground transport. (See AMC 31HB.45(a))

(b) The compatibility of the cells material with the fuel must be justified. Fatigue, ageing, fire resistance and corrosion capability of the cells must be assessed and any necessary limitation, protection or maintenance action must be determined.

(c) Fuel cells, their attachments and related supporting structure must be shown by tests to be capable of withstanding, without detrimental distortion or failure, any inertia loads to which the installation may be subjected in operation. (See AMC 31HB.45(c))

(d) A pressurised fuel cell must be equipped with:

(1) A shut-off valve. This valve must be equipped with a self-sealing coupling, or other means to avoid the release of hazardous quantities of fuel should the control be inadvertently operated without a fuel line connected. (See AMC 31HB.45(d)(1))

(2) A pressure relief valve, which must protect the fuel cell against over pressurisation.

(3) A means to control the maximum filling.

(4) A means to assess the fuel quantity. (See also CS 31HB.47(c)(2))

(5) A data plate containing information necessary for safe operation. (See AMC 31HB.45(d)(5))

(e) Guards must be fitted to all fuel cells to protect the valves and other fittings from fuel leakage in case of:

(1) Inadvertent operation and

(2) Damage, during normal operation, ground handling or transport.

(f) Rigid extensions must not be fitted directly to fuel cell valves or fittings due to the likelihood of overload or fracture occurring in the case of a hard or fast landing. (See also CS 31HB.46)

AMC 31HB.45(a) Fuel cells

The fuel cell design and manufacture should be verified by a test programme agreed by the Authority. This test programme should consider burst testing, fatigue testing, impact testing, drop testing, fire testing, macro examination of the material of the cell cylinder and welded joints (if applicable) and material variability.

Note: Road, ship or aircraft transport of fuel cells and their storage is an inherent characteristic of Hot Air Balloon operation. In order to comply with Transport and Storage legislation it is recommended to consider in parallel to airworthiness issues the compliance with such legislation applicable to pressurised gas containers (e.g. Accord européen relatif au transport international des marchandises Dangereuses par Route (ADR)).

AMC 31HB.45(c) Fuel cells

The restraint of a full fuel cell (e.g. straps) should not detach under typical high g-loads experienced during a hard or fast landing.

In case of fuel cells supported at the lower end by the basket floor or other structure, the straps and buckle restraining a fuel cell shall be designed as applicable to a horizontal limit load of 6.0g and upward limit load of 2.0g. The factor of safety of 1.50 is applicable to these fuel cell straps.

The strap and buckle design should be shown to maintain sufficient pre-tensioned after a flight to withstand the upward limit load of 2.0g. The handling of the strap and buckle shall allow proper pre-tension, reliable locking, but also easy release e.g. for emergency fuel cell removal. Industry standards like EN 12195-2, ASTM D3950 or equivalent using the appropriate strap type and grade are considered appropriate standards.

Consideration of applied loads on fuel cells should include handling and transport cases.

[Amdt No.: 31HB/1]

AMC 31HB.45(d)(1) Fuel cells

The shut-off valve should be free from restrictors (excess flow limiters or overfill protection devices) that could fail in the closed position.

AMC 31HB.45(d)(5) Fuel cells

The fuel cell data plate should include the following information:

- the manufacturers name or mark;
- the type design approval number (if applicable);
- the manufacturers serial number;
- the UN number and the proper name of the gas or mixture of gases (e.g. UN1978 Propane); and
- the maximum filling of the receptacle with the fittings and accessories as fitted at the time of filling.

Note: The data plate should include, where applicable, information to allow safe filling by commercial facilities (e.g. filling by weight). Where a fuel cell has been designed to a standard which is not compatible with comparable industrial standards, the data plate should include the statement “For use in Hot Air Balloons only”.

CS 31HB.46 Pressurised fuel systems

(a) For pressurised fuel systems each part, must be tested to, or have a safe working pressure of at least twice the maximum pressure to which the system will be subjected in normal operation. In the test, no part of the system may leak, fail or malfunction.

(b) All parts of a pressurised fuel system must be generally robust and capable of withstanding impact and abuse loads and related deformation that are likely to occur in service. (See AMC 31HB.46(b))

(c) If applicable, parts of the pressurised fuel system must be permanently marked to preclude incorrect installation.

(d) No part of the system may have an unprotected rigid extension that could be broken in any likely impact situation. (See also CS 31HB.45(f)).

(e) Where fuel systems include demountable fuel lines, a self-sealing coupling, or other means must be fitted to each outlet of each line to avoid the release of hazardous quantities of fuel should a fuel cell valve be inadvertently operated without a fuel line outlet connected.

AMC 31HB.46(a) Pressurised fuel systems

The pressurised fuel system parts include as applicable:

- fuel cells;
- lines and hoses;
- manifolds (including T-pieces);
- fittings.

AMC 31HB.46(b) Pressurised fuel systems

Connecting parts such as manifolds (including T-pieces) and hoses, between fuel cells should be designed so that they are not subject to pulling forces by significant deformation of the basket during a hard landing. Rigid extensions should be avoided in the design. If rigid extensions are used and could be broken in any likely impact situation they shall be protected.

Abuse loads likely to occur, such as the grabbing of a fuel hose by a passenger during landing or the abrasion of a fuel hose by a control line, should be considered. Hoses should be suitably reinforced (e.g. steel braiding) to withstand these conditions.

Note: Commercially available brass fittings for LPG systems should not be used as they have been shown not to have the required level of robustness.

For fuel system parts extending outside the protected area of the load frame and basket, it should be considered that they might be impacted by obstacles or abuse loads.

AMC 31HB.46(e) Pressurised fuel systems

“Demountable fuel lines” in the sense of this requirement are fuel lines that are linked by quick disconnect couplings.

CS 31HB.47 Heater system

(a) The system must be designed and installed so as not to create a fire hazard.

(b) Parts adjacent to a heater (and if applicable, its flame) and the occupants must be protected from excessive heat.

(c) There must be controls, instruments, or other equipment essential to safe control and operation of the heater system. They must be shown to be able to perform their intended functions during normal and emergency operation.

(1) Where a heater system has more than one fuel supply or more than one control on each fuel supply, there must be unambiguous means to

differentiate between each control, its source of supply and its function. (See AMC 31HB.47(c)(1))

(2) The heater system must have a device or other means to indicate the quantity of fuel available. (See AMC 31HB.47(c)(2))

(3) For a burner, each control system must have a device that indicates whether the heat output is high, normal or low. (See AMC 31HB.47(c)(3))

(d) The reliability of the heater system must be substantiated by a test designed to reflect the limiting conditions likely to be encountered in service, both in kind and duration.

(1) For a burner, the test must include at least three flameouts and restarts.

(2) Each element of the system must be serviceable at the end of the test.

(e) For a burner, the pilot light (or other means of ignition) must be shown to operate reliably in typical gusts and rain, must be readily accessible for relighting and must be easily relit. Continued operation of a heater must be possible in the event of a sustained pilot light failure.

(f) Except in single-occupant balloons, the heater system must be designed so that in the event of any single failure, it will retain sufficient heat output to maintain level flight. (See AMC 31HB.47(f))

AMC 31HB.47(c)(1) Heater system

Colour coding of controls and fuel feeds is an acceptable means of compliance.

AMC 31HB.47(c)(2) Minimum equipment

An indication whether the individual fuel cell is FULL and indication for the use of the last 30% (or more) of the usable amount of fuel is considered compliant with this requirement.

AMC 31HB.47(c)(3) Heater system

A device that indicates the fuel pressure before entering each main blast valve is considered compliant with this requirement.

AMC 31HB.47(f) Heater system

For those single occupant balloons which do not meet the single failure criteria in the requirement, measures to compensate for the increased likelihood of a cold descent landing (i.e. one without the assistance of a heater system) should be discussed with the Authority.

CS 31HB.49 Control systems

(a) Each control must operate easily, smoothly, and positively enough to allow proper performance of its functions. Controls must be so arranged and identified to prevent confusion and inadvertent operation.

(b) Each control system and operating device must be designed and installed in a manner that will prevent jamming, chafing, or unintended interference from passengers or loose items of equipment. The elements of the control system must have design features or must be distinctly and permanently marked to minimise the possibility of incorrect assembly that could result in malfunctioning of the control system.

(c) To prevent bursting of the envelope, each mixed balloon using a captive gas as a lifting means must be equipped with a valve or appendix through which sufficient gas volume can be released automatically once the maximum operating pressure is reached.

(d) Each Hot Air Balloon must have a means to allow the controlled release of hot air during flight unless the balloon complies with CS 31HB.20 without it.

(e) For the purpose of envelope material protection, each Hot Air Balloon must have a means to indicate the maximum envelope skin temperature or maximum internal air temperature during operation. (See AMC 31HB.49(e))

AMC 31HB.49(e) Control systems

The use of a signal warning device, which actuates at a temperature below the limiting safe temperature, is an acceptable means of compliance.

If the actuation of the signal warning device is of a non-recurring type, the Flight Manual should contain appropriate instructions as to the safe operation of the balloon after the actuation of the signal warning device.

CS 31HB.51 Disposable ballast

Each mixed balloon using disposable ballast must have means for safe storage and release of the disposable ballast. (See AMC 31HB.51)

AMC 31HB.51 Disposable ballast

Ballast material should be easily transferred, disposed of and dissipated. Means should be provided to prevent freezing and/or blocking the release of the ballast material. The material should not pollute the environment.

Dry sand is a well proven material and is considered as suitable in the sense of this paragraph and this AMC.

The disposable ballast may be necessary for the pilot to perform the flight path management. The pre-take-off decision on the amount of disposable ballast should be left to the pilot as it is dependent on the flight task, the weather etc.

CS 31HB.53 Drag rope

If a drag rope is used, the end that is released overboard must be stiffened to preclude the probability of the rope becoming entangled with trees, wires, or other objects on the ground.

CS 31HB.55 Rapid deflation means

(a) The envelope must have means to allow for rapid deflation after landing. The system must be designed to minimize the possibility of inadvertent operation. If a system other than a manual system is used, the reliability of the system used must be substantiated. (See AMC 31HB.55(a)).

(b) If a mixed balloon is equipped with a lateral rapid deflation means, a device must be installed to align the balloon during landing in order to turn the rapid deflation means into its designated position. (See AMC 31HB.55(b))

AMC 31HB.55(a) Rapid deflation means

A deflation is considered as "rapid" if after touch-down the balloon envelope is adequately prevented from "sailing" and being dragged too much over the ground by the wind.

AMC 31HB.55(b) Rapid deflation means

The installation of turning vents or a drag rope is considered as a suitable device to align the balloon during landing in the sense of this subparagraph.

CS 31HB.57 Control cords

(a) General

(1) All control cords used for flight control must be designed and installed to preclude entanglement and inadvertent operation.

(2) The maximum force required for their operation must not exceed 340 N.

(3) All control cords used for flight control must be long enough to allow for an increase of at least 10 % in the vertical dimension of the envelope.

(b) Arming device

If an arming device is employed to prevent inadvertent operation of an irreversible control, the part of the device to be handled by the pilot must be coloured with yellow and black bands.

(c) Turning vent cords

If turning vent cords are used to orient the balloon for landing, the part of cords to be handled by the pilot for turning to the left must be coloured black and the corresponding part of the cord used for turning to the right must be coloured green. (See AMC 31HB.57(c)).

(d) Venting cords

(1) If a venting cord is used to allow controlled release of the lifting gas and the vent can be resealed in flight, the part of the cord to be handled by the pilot must be coloured with red and white bands.

(2) If a further cord is required to re-seal any vent, the part of the cord handled by the pilot must be coloured white.

(e) Rapid or emergency deflation cords

(1) If a cord is used for rapid or emergency deflation of the envelope and the device cannot be resealed in flight, the part of the cord to be handled by the pilot must be coloured red.

(2) In addition to the force requirement of CS 31HB.57(a)(2) above, the force required to operate a rapid or emergency deflation cord must not be less than 110 N.

AMC 31HB.57(c) Control cords; Turning vent cords

In the interests of reducing the pilot's workload during the critical approach phase, it should be possible to operate the turning vents (to a sufficient extent to align the basket for landing, if this is required) with one hand.

CS 31HB.59 Baskets

(a) The basket may not rotate independently of the envelope unless:

(1) the rotation is under control of the pilot; and

(2) entanglement of operating lines is prevented.

(See AMC 31HB.59(a))

(b) Each projecting object on the basket, that could cause injury to the occupants, must be padded.

(c) Occupants of a basket must be protected during hard or fast landings against:

(1) falling from the basket;

(2) serious injuries. (See AMC 31HB.59(c))

(d) When more than six occupants are carried, the basket must be divided into compartments, each containing not more than six occupants.

(e) Where basket proportions and compartmentation are such that more than one occupant may fall on top of another during landing, there must be means to minimise this possibility. (See AMC 31HB.59(e))

(f) Reasonable space must be provided for all occupants, with regard to both comfort during the flight and to safety during the landing. (See AMC 31HB.59(f))

(g) The space for the pilot must provide unobstructed operation in all flight phases.

(h) There must be hand holds for each occupant. (See AMC 31HB.59(h))

(i) Means must be provided to allow drainage of vapour or liquid from the bottom of the basket.

(j) The load-bearing parts (e.g. ropes or cables) of the suspension system must be routed in a way that excludes the possibility of them being damaged in normal service.

(k) The basket floor must not project beyond the sidewalls.

(l) Limitations on the occupancy and configuration of a basket must be provided in the Flight Manual. (See CS 31HB.81 and AMC 31HB.59(l))

[Amdt No.: 31HB/1]

AMC 31HB.59(a) Baskets

The purpose of this subparagraph is to prevent entanglement of operating lines due to uncontrolled rotation.

It should be noted that uncontrolled rotation, causing entanglement of operating lines, may also occur during landings with basket tip-over if the plan view of the basket floor is circular or more than hexagonal.

AMC 31HB.59(c) Baskets

An internal height of the basket of 1.10 m, protecting the occupants carried from falling from the basket is considered compliant to this requirement.

AMC 31HB.59(e) Baskets

Alignment of the basket for landing using turning vents or a drag rope or an equivalent feature and Flight Manual instructions specifying that the basket should be aligned to land on one of its longer sides can be used to show compliance to this requirement. No more than two occupants may be positioned in the landing direction without means to prevent them from falling on top of each other.

If the plan view of the basket floor is circular or more than hexagonal, it should be noted that the basket may be rotationally unstable during fast drag landings. This may present a risk to occupants.

AMC 31HB.59(f) Baskets

Unless otherwise justified on safety grounds, a minimum figure of between 0·25 m^2 and 0·3m^2 plan area should be used for each standing occupant, with proper account being taken of the specified size, number and position of equipment when applying this figure. There should be enough space provided for passengers to take a brace position for landing. The Authority should be consulted in cases where a basket's shape or compartmentation makes the measurement of this figure subjective.

AMC 31HB.59(h) Baskets

Handholds should be provided as an obvious means for the occupants to safely hold on to during a landing. The location or design of the handholds should provide protection of the hands from impact during a landing.

AMC 31HB.59(l) Baskets

This information should state, for each permissible model of basket or other means provided for the occupants, the maximum permitted occupancy in relation to specified sizes, numbers and positions of equipment items.

CS 31HB.63 Occupant restraint

(a) There must be a restraining means for all occupants, which can take the form of hand holds. (See CS 31HB.59(h))

(b) For baskets having a separate pilot compartment, there must be a suitable restraint for the pilot which must meet the strength requirements of CS 31HB.30. Additionally, the restraint must be designed so that:

(1) the pilot can reach all the necessary controls when the restraint is correctly worn and adjusted;

(2) there is a method of quick release that is simple and obvious; and

(3) the possibility of inadvertent release is minimised.

AMC 31HB.63(a) Occupant restraint

Note: Operational legislation may also require pilot restraint to be fitted to balloons which have a single compartment basket.

CS 31HB.67 Tethered flight

The pilot must be provided with an indication that any applicable limitations for tethered flight are being, or have been reached. (See AMC 31HB.67)

AMC 31HB.67 Tethered flight

The inclusion of an appropriate device or instrument (rated "weak link", hand held anemometer, windsock etc.) to provide the pilot with an attention-getting indication of the balloon's tethering limitation, is considered compliant with CS 31HB.67.

SUBPART F – EQUIPMENT

CS 31HB.71 Function and installation

(a) Each item of required equipment must:

(1) be of a kind and design appropriate to its intended function;

(2) be labelled or marked to identify its function or operating limitations, or any applicable combination of these factors;

(3) be installed according to limitations specified for that equipment; and

(4) function properly when installed. (See AMC 31HB.71(a)(4))

(b) Instruments and other equipment may not in themselves, or by their effect upon the balloon, constitute a hazard to safe operation.

AMC 31HB.71(a)(4) Function and installation

The correct functioning should not be impaired by operational circumstances such as icing, heavy rain, high humidity or low and high temperatures. The equipment, systems, and installations should be designed to prevent hazards to the balloon in the event of a probable malfunction or failure of that equipment.

When ATC equipment and/or positioning lights as possibly required by operational rules are installed, it should be shown that the electrical system is such that the operation of this equipment is not adversely affected by operational circumstances.

CS 31HB.72 Miscellaneous equipment

Each balloon must be equipped with:

(a) General:

(1) A standby source of ignition for the pilot light or burner.

(2) An envelope temperature indicator, which may either be of the continuous reading type or a type that gives a warning signal. (See also CS 31HB.49(e))

(3) Where flight manual limitations specify a rate of climb or descent; a rate of climb/descent indicator (variometer).

(4) A fire extinguisher. (See AMC 31HB.72(a)(4))

(b) A 'kit' of tethering components, if the balloon is specifically approved for tethered operations. (See CS 31HB.28)

(c) For mixed balloons minimum ballast, if applicable.

[Amdt No.: 31HB/1]

AMC 31HB.72(a)(4) Miscellaneous equipment

Fire extinguishers should:

(i) conform to EN3 or an equivalent specification acceptable to the Authority;

(ii) have a minimum capacity of 2 kg when using dry powder, or when the extinguishing means is other than dry powder be at least of comparable effect and capacity.

[Amdt No.: 31HB/1]

SUBPART G – OPERATING LIMITATIONS AND INFORMATION

CS 31HB.81 Operating instructions

(See AMC 31HB.81)

(a) Operating instructions must be furnished in a Flight Manual with each balloon.

(b) Flight Manual Information and Approval. The Flight Manual must contain:

(1) A description of the balloon and its technical equipment with explanatory sketches;

(2) Operating limitations, normal procedures (including rigging, inflation and deflation), emergency procedures, and other relevant information specific to the balloon's operating characteristics and necessary for safe operation. This section of the manual requires approval (See AMC 31HB.81(b)(2));

(3) Specification of the permissible lifting gas (for mixed balloons only); and

(4) Information for ground handling, transport and storage.

(c) The operating limitations, normal and emergency procedures, and other relevant information specific to the balloon's operating characteristics and necessary for safe operation must be provided to the pilot. (See AMC 31HB.81(c))

AMC 31HB.81 General

(i) It is recommended that the Specimen Flight Manual of CS-22 (AMC 22.1581) be used as guidance in the creation of a Balloon Flight Manual.

(ii) Each part of the Flight Manual that is required to be approved should be segregated, identified and clearly distinguished from each unapproved part of that manual.

(iii) A comprehensive list of approved basket, burner and envelope configurations should be provided for each balloon model, to enable operators, inspectors etc. to easily establish an item's acceptability.

(iv) If applicable, the operating limitations, normal and emergency procedures should include procedures and limitations for tethered flight. These procedures and limitations should include:

(1) site selection, layout and assembly;

(2) the maximum wind speed and meteorological conditions for tethered operation;

(3) the MTOM (if different from free flight);

(4) the maximum height of the tether;

(5) the minimum strength of ropes, rigging etc.;

(6) limitations on occupancy (if applicable).

AMC 31HB.81(b)(2) General

Operating procedures should provide empty mass information required by CS 31HB.16 in an unambiguous manner that will allow the verification of the balloon's mass limitations before flight.

AMC 31HB.81(c) General

The operating limitations, normal and emergency procedures should be available to the pilot during operation by providing the specific sections of the flight manual or by other means (e.g. placards, quick reference cards) that effectively accomplish the purpose.

CS 31HB.82 Instructions for continued airworthiness

(a) The instructions for Continued Airworthiness must include information essential to the Continued Airworthiness of all parts and appliances of the balloon as required by CS-31HB.

(b) The instructions for Continued Airworthiness must be in the form of a manual or manuals as appropriate for the quantity of data provided.

(c) The format of the manual or manuals must provide for a practical arrangement. (See AMC 31HB.82(c))

(d) The instructions for Continued Airworthiness must cover:

(1) a detailed description of the balloon and its components, systems and installations; (See AMC 31HB.82(d)(1))

(2) handling instructions;

(3) basic control and operating information describing how the balloon's components, systems and installations operate;

(4) servicing information;

(5) a maintenance schedule against which the balloon must be inspected and maintained; (See AMC 31HB.82(d)(5))

(6) maintenance and inspection instructions; (See AMC 31HB.82(d)(6))

(7) repair instructions;

(8) trouble-shooting information; and

(9) airworthiness limitations that set forth each mandatory replacement time, inspection interval and related inspection procedure. This section of the manual requires approval. (See AMC 31HB.82(d)(9))

AMC 31HB.82(c) Instructions for continued airworthiness

(i) If instructions for continued airworthiness are not supplied by the manufacturer or designer of parts and appliances installed in the balloon, the instructions for continued airworthiness for the balloon should include the information essential to the continued airworthiness of the balloon.

(ii) If manuals from different manufacturers are used they should provide a practical arrangement.

AMC 31HB.82(d)(1) Instructions for continued airworthiness

The detailed description of the balloon and its components should include for each balloon:

(i) a description of the systems including the assembly and disassembly instructions;

(ii) a parts list covering all construction and equipment components and the assemblies. Where applicable individual parts should be numbered so that they can be related to the different assemblies and that their number corresponds to the type plate of the assembly;

(iii) a summary of the materials and consumables used with procurement details.

AMC 31HB.82(d)(5) Instructions for continued airworthiness

If applicable the maintenance schedule may include instructions for continued airworthiness (e.g. recommended inspections or mandatory replacement of parts) to ensure the suitable protection of parts against deterioration or loss of strength, objective pass or fail criteria e.g. applicable wear tolerances should be provided.

AMC 31HB.82(d)(6) Instructions for continued airworthiness

The maintenance and inspection instructions should provide information for removal and installation, cleaning, inspecting, adjusting, testing and lubrication of systems, parts and appliances of the balloon as required for continued airworthiness. Reference may be made to information from an accessory, instrument or equipment manufacturer as the source of this information if it is shown that the item has an exceptionally high

degree of complexity requiring specialised maintenance techniques, test equipment or expertise.

AMC 31HB.82(d)(9) Instructions for continued airworthiness

If the instructions for continued airworthiness consist of multiple documents, the Airworthiness Limitations section should be included in the principal manual.

CS-31TGB (INITIAL ISSUE)

SUBPART A — GENERAL

CS 31TGB.1 Applicability

These Certification Specifications (CSs) are applicable to non-free flying manned tethered gas balloons that operate up to a maximum altitude of 500 m above the surface, and that derive their lift from non-flammable gas being lighter than air.

CS 31TGB.2 Definitions

Definition of terms and principles used:

(a) A tethered gas balloon consists of a balloon system (envelope, suspension system and gondola) and a tether system that continuously anchors it during operation.

(b) The tether system (winch, pulley, cable and swivel point) includes all components affected by forces resulting from tethering up to and including interface parts with the foundation or counterweight.

(c) The mooring system includes all components affected by forces resulting from the applicable types of mooring (e.g. high and/or low mooring).

(d) The suspension system includes all components suspending the gondola to the envelope (if applicable including the net).

(e) A gondola is a basket or other device (e.g. container, trapeze, harness, seat or platform) suspended beneath the envelope to accommodates the balloon occupants.

(f) The envelope contains the lifting gas.

(g) The swivel point is the connection between the tether system and balloon system allowing rotation of the balloon independent from the tether cable.

(h) Ascent/descent system is the part of the tether system raising and lowering the balloon.

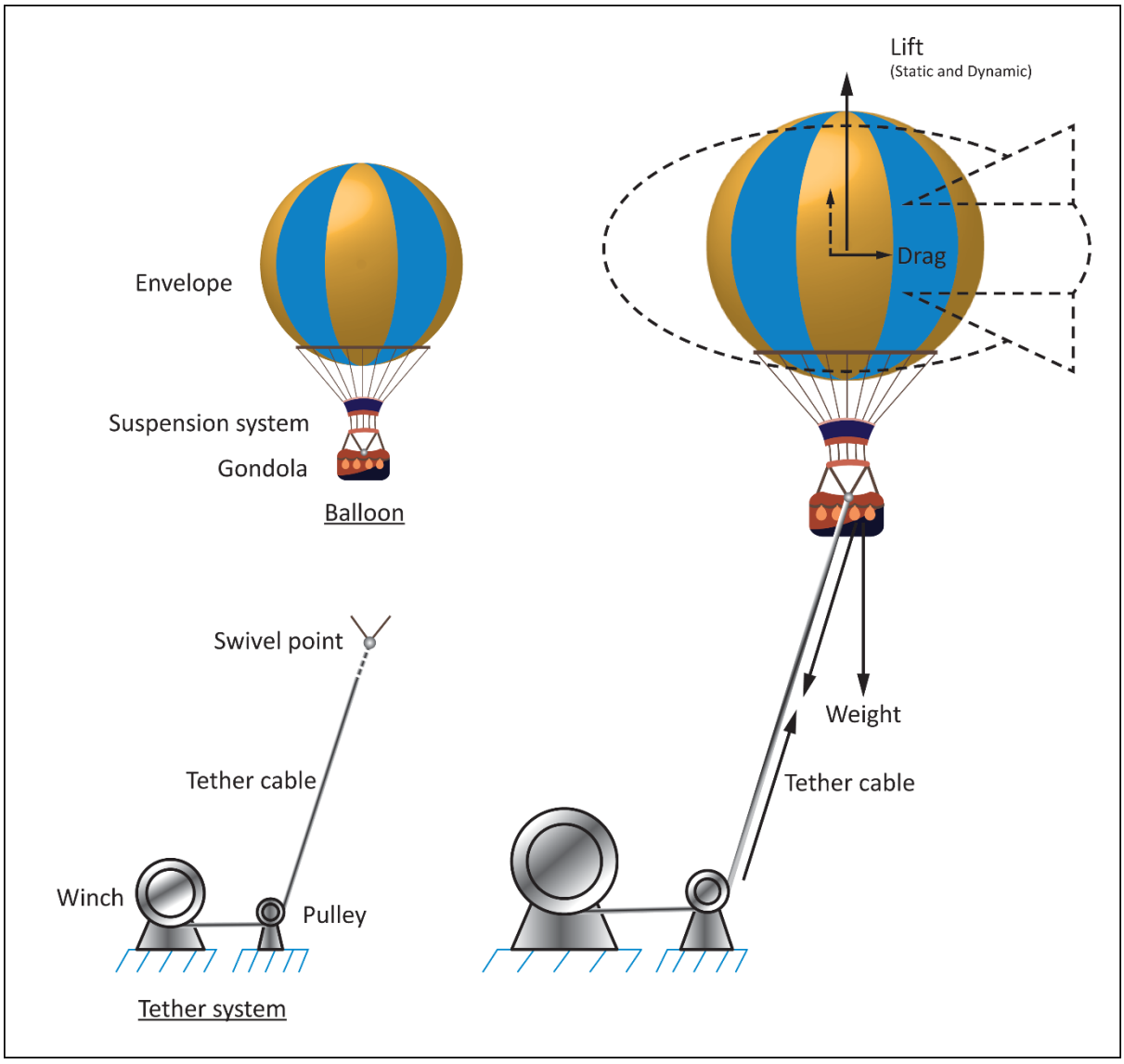
(i) The maximum lift is the sum of the maximum static lift from the lifting gas volume and the maximum dynamic lift, at sea level in International Standard Atmosphere conditions.

(j) The maximum dynamic lift is the highest lift force at the chosen maximum operating wind condition at sea level in International Standard Atmosphere conditions.

AMC1 31TGB.2 Definitions

The illustration below shows a typical example of the various systems, parts and forces of the tethered gas balloon in order to distinct their function as provided in the definitions.

Note: Lift*Dynamic is disregarded for load cases of spherical envelope shapes.



SUBPART B — FLIGHT

CS 31TGB.12 Proof of compliance

Each requirement of this Subpart is met at each mass and lift combination within the operating conditions for which certification is requested. This is shown by:

(a) Tests upon a balloon of the type for which certification is requested or by calculations based on, and equal in accuracy to, the results of testing; and

(b) Systematic investigation of each mass and lift combination if compliance cannot be reasonably inferred from the masses investigated.

CS 31TGB.14 Mass limits

The range of masses over which the balloon may be safely operated is established and at least consists of:

(a) Maximum mass.

The maximum mass is the highest mass at which compliance with each applicable requirement of CS-31TGB is shown. The maximum mass is established so that it is not more than the least of:

(1) the maximum mass selected for the product; or

(2) the design maximum mass, which is the highest mass at which each structural loading condition is shown.

(b) Minimum mass:

The minimum mass is the lowest mass at which compliance with the structural loading requirement is shown for the tether system.

(c) Mass limitation information related to safe operation of the balloon are included in the Flight Manual. (See CS 31TGB.81(b)(2))

AMC1 31TGB.14 Mass limits

Maximum mass

The maximum mass results in a weight force that is equal or lower to the maximum static lift force. The lift-producing medium is not part of the maximum mass.

For each structural loading case the maximum mass is established. The maximum mass consists of the balloon and the length of the tether cable, which weight force acts upon the balloon in the specific load case.

The maximum design mass of the product is the least of the maximum masses established for the load cases or a lower maximum mass if so selected by the applicant.

Minimum mass

The minimum mass is the mass that results in the highest loading in the tether system under the following conditions for which compliance to the structural requirements is shown:

- Maximum deceleration during ascent
- Maximum static lift
- Maximal permissible wind speed of operation

Since the mass increases with the extension of the tether cable, the critical case for the minimum mass is reached at the beginning of the ascent.

Mass limitations and information, e.g. pay load are established from the maximum and minimum masses and provided in the Flight Manual.

CS 31TGB.20 Controllability

(a) The balloon is safely controllable and manoeuvrable without requiring exceptional skill. Associated operational limitations are established and included in the Flight Manual. (See CS 31TGB.81(b)(2))

(b) The continuing controllability of the balloon or other mitigations are provided to give each occupant every reasonable chance of escaping serious injury in the following emergency conditions:

(1) Potential or unintended free flight.

(2) Terminating operation in wind conditions exceeding the operating limitations by 50 %.

(3) Tether system failure that prevents descent from the maximum operating height or any other height if considered more critical.

AMC1 31TGB.20(b) Controllability

It is established by analysis that the hazards from the specified emergency conditions are mitigated by design or procedures. Failure modes that can result in an unintended free flight of the balloon with occupants are included in this analysis.

A suitable device (e.g. electronic altitude pressure switch combined with an ascent velocity detector) ensuring that the envelope does not burst and a lifting gas valve is operated such that a descent occurs in a manageable manner is regarded as acceptable.

A suitable procedure describes all necessary measures to be taken for the recovery.

If procedures for these emergency conditions are not covered by the normal operating procedures they are included in the Flight Manual.

SUBPART C — STRUCTURE

CS 31TGB.21 Loads

Strength requirements are specified in terms of:

(a) limit loads that are the maximum loads to be expected in service, taking into account the load factors of CS 31TGB.23; and

(b) ultimate loads that are limit loads multiplied by factors of safety defined in CS 31TGB.25.

CS 31TGB.22 In-Service load cases

The strength requirements include consideration of the applicable in-service load cases such as:

- inflation;
- flight; and
- mooring.

The loads are determined and the parts and components under particular stress designed in accordance with their designated use and dimensioned such as not to fail under recurrent loads.

AMC1 31TGB.22 In-Service load cases

Inflation/mooring

The 'inflation and mooring cases' referred to in this requirement cover assembly, disassembly, inflation, deflation and mooring load cases. Mooring load cases cover both low and high mooring, if applicable.

When the balloon is moored in the parking position (low mooring) the maximum gas pressure in the envelope is normally identical to the 'maximum gas pressure' established for any of the flight conditions. If the low mooring operation, however, allows for a precautionary increased pressure of the gas in the envelope this load case is also considered.

Flight

Flight load cases cover the operation within the established limitations (temperature, wind speed, mass, and ascent/descent speed limitations). A dynamic lift component is considered in the load cases for the sudden deceleration of the ascent/descent unit and when the envelope shape is not spherical and generates lift in wind conditions. When a dynamic lift component is applicable, gust loads are considered as well as

potential oscillation behaviour of the balloon and the tether caused by airflow and from variations in the lift component and its centre of pressure.

CS 31TGB.23 Load factors

(a) Flight load factor. In determining limit load, the flight load factor is at least 1·4, except for (b).

(b) Ascent load factor. In determining limit load on the tether system, the ascent load factor appropriate for the type of operation is established and applied to the static load cases on the tether system.

(c) Gust load factor. In determining limit load, the gust load factor is established for the effect of gusts as defined in the operating limitations.

AMC1 31TGB.23(b) Ascent load factors

The ascent load factor is applied to the static tether system load to cover dynamic loads to the tether system resulting from decelerations during the ascent. The maximum deceleration typically occurs when an emergency stop is made during maximum ascent speed. The highest loads are typically experienced when this occurs at maximum static lift and minimum balloon weight and minimum deceleration travel. Minimum balloon weight and minimum deceleration travel coincide at low tether cable length when the mass of the tether cable is the lowest and the elongation or slack of the tether cable are the lowest.

For an ascent speed below 1 m/sec, an ascent load factor of 2 is acceptable.

AMC1 31TGB.23(c) Gust load factor

A gust load factor is applicable to balloons that due to the shape of the envelope generate aerodynamic lift forces in gust conditions. The gust load for spherical balloons is, therefore, 1 and is considered to have no influence on the loads.

CS 31TGB.25 Factors of safety

(a) A factor of safety is used in the balloon system design as provided in the table.

	Safety factor
Envelope	5·00
Suspension and tethering components (fibrous or non-metallic)	3·50
Suspension and tethering components (metallic)	2·50
Other (This includes mooring components not used for suspension or tethering)	1·50

(b) Regardless of the materials used, the load-bearing components of the suspension and tethering system is designed so that failure of any single component will not jeopardise safety of flight, and that total failure is extremely

remote. Account is taken of any reasonably foreseeable dynamic or asymmetric loading affects associated with the initial element's failure.

(c) Where no provision is made for duplication in the suspension or tether system, the factor of safety is to be multiplied by a factor of 1·5.

(d) For design purposes, an occupant mass of at least 77 kg is assumed.

AMC1 31TGB.25(b) Factors of safety

The dynamic loads on a balloon system are difficult to evaluate because metal or textile parts behave quite different.

In absence of a more suitable method or as replacement of a load test, the failure of the load bearing component shall be shown by the following method:

Multiply the limit load in the failing load path by two and distribute it as a static load among the remaining load paths.

For conventional designs, this is an appropriate method which is based on good service experience.

CS 31TGB.27 Strength and proof of strength

(a) The structure is able to support limit loads without permanent deformation or other detrimental effects.

(b) The structure is able to withstand ultimate loads for at least 3 seconds without failure.

(c) Proof of strength of the envelope material and other critical design features are tested.

(d) The gondola is of a generally robust design and provides the occupants adequate protection during a hard landing.

(e) The design and strength of components also considers the effects of recurrent and other loads experienced during transportation, ground handling, and mooring.

(f) The effect of temperature and other environmental conditions that may affect strength of the balloon is accounted for.

AMC1 31TGB.27(c) Strength and proof of strength

The envelope tests may be performed on representative portions of the envelope provided the dimensions of these portions are sufficiently large to include critical design features and details such as critical seams, joints, load-attachment points, net mesh, etc. Also refer to CS 31TGB.45 for specific tear propagation requirements.

AMC1 31TGB.27(e) Strength and proof of strength

The strength requirements need to include consideration of loads during transport, ground handling and rigging. The loads need to be determined and the parts and components need to be designed in accordance with their designated use and dimensioned such as not to fail under recurrent loads.

SUBPART D — DESIGN AND CONSTRUCTION

CS 31TGB.31 General

The suitability of each design detail or part that bears on safety is established by tests or analysis.

CS 31TGB.33 Materials

The suitability and durability of materials used for parts, the failure of which could adversely affect safety:

(a) are established by experience or tests; and

(b) meet approved specifications that ensure that the materials have the strength and other properties assumed in the design data.

AMC1 31TGB.33(b) Materials

Approved specifications here are taken as being those produced by the applicant or those meeting internationally recognised standards as defined applicable in the type design data. Material specifications are those contained in documents accepted either specifically by the Authority or by having been prepared by an organisation or person which the Authority accepts has the necessary capabilities. In defining design properties, these material specification values are modified and/or extended as necessary by the constructor to take account of manufacturing practices (for example method of construction, forming, machining and subsequent heat treatment). Also the effects of environmental conditions, such as temperature and humidity expected in service, are taken into account.

CS 31TGB.35 Fabrication methods

The methods of fabrication used produces a consistently sound structure. If a fabrication process requires close control to reach this objective, the process is performed in accordance with an approved process specification.

AMC1 31TGB.35 Fabrication methods

Approved fabrication methods here are taken as being those produced by the applicant or those meeting internationally recognised standards as defined in the applicable type design data. Fabrication methods are those contained in documents accepted either specifically by the Authority or by having been prepared by an organisation or person which the Authority accepts has the necessary capabilities.

CS 31TGB.36 Stress concentrations

The structure is designed to avoid, as far as practicable, points of stress concentration and variable stresses that would cause fatigue to occur in normal operation.

CS 31TGB.37 Fasteners

(a) Fasteners (e.g. bolts, pins, screws, karabiners) used in the structure conform to approved specifications.

(b) Locking methods are established and documented.

(c) Unless a joint is free from relative movement, secondary locking means are used.

(d) Self-locking nuts are not used on bolts that are subject to rotation in service.

AMC1 31TGB.37(a) Fasteners

Approved specifications in the sense of these requirements are the standards described in the AMC1 31TGB.33(b).

CS 31TGB.39 Protection of parts

Parts, the failure of which could adversely affect safety, are suitably protected against deterioration or loss of strength in service due to weathering, corrosion, heat, abrasion, ground handling, ground transport, flight conditions or other causes.

AMC1 31TGB.39 Protection of parts

Suspension system cables and components manufactured from stainless steels (corrosion resistant steels) are considered compliant with this requirement.

To ensure the protection of parts, it is permissible to rely on recommended inspections (details in the Maintenance Manual).

In cases where deterioration or loss of strength is unavoidable during the life of the product, details of appropriate mandatory replacement lives or in-service testing are provided in the maintenance programme (CS 31TGB.82).

CS 31TGB.41 Inspection provisions

There are means to allow close examination of each part that requires repeated inspection and adjustment.

CS 31TGB.43 Balloon system controls

(a) Each control can be operated easily, smoothly, and positively to allow proper performance of its functions. Controls are arranged and identified to prevent confusion or inadvertent operations.

(b) Each control system and operating device is designed and installed in a manner that will prevent jamming, chafing, or unintended interference from passengers or loose items of equipment. The elements of the control system have design features or are distinctly and permanently marked to minimise the possibility of incorrect assembly that could result in failure of the control system.

(c) Control cords

(1) General

(i) All control cords used for flight control are designed and installed to preclude entanglement and inadvertent operation.

(ii) The maximum force required for their operation does not exceed 340 N.

(iii) All control cords used for flight control are long enough to allow an increase of at least 10 % in the vertical dimension of the envelope.

(iv) Arming cords. If an arming device is employed to prevent inadvertent operation of an irreversible control, the part of the device to be handled by the operator is coloured with yellow and black bands.

(2) Venting cords

(i) If a venting cord is used to allow controlled release of the lifting gas and the vent can be resealed in flight, the part of the cord to be handled by the operator is coloured with red and white bands.

(ii) If a further cord is required to re-seal any vent, the part of the cord handled by the operator is coloured white.

(3) Rapid or emergency deflation cords.

(i) If a cord is used for rapid or emergency deflation of the envelope and the device cannot be resealed in flight, the part of the cord to be handled by the operator is coloured red.

(ii) In addition to subparagraph CS 31TGB.43(c)(1)(ii) the force required to operate the emergency deflation cord is not less than 110 N.

CS 31TGB.45 Protection of envelope against tearing

The design of the envelope is such that, while supporting limit load, local damage will not grow to an extent that results in an uncontrolled landing.

AMC1 31TGB.45 Protection of envelope against tearing

Demonstration of sufficient rip-stopping capability of the envelope material.

The objective of this demonstration is to show that the envelope material is sufficiently damage resistant. It therefore needs to be determined that the envelope material would not continue to tear under the maximum tension and conditions (temperature) experienced in normal operation.

In order to establish that the determined damage resistance is sufficient, the critical damage should be reviewed in relation to local damage foreseeable in normal operation.

The local damages to be considered are:

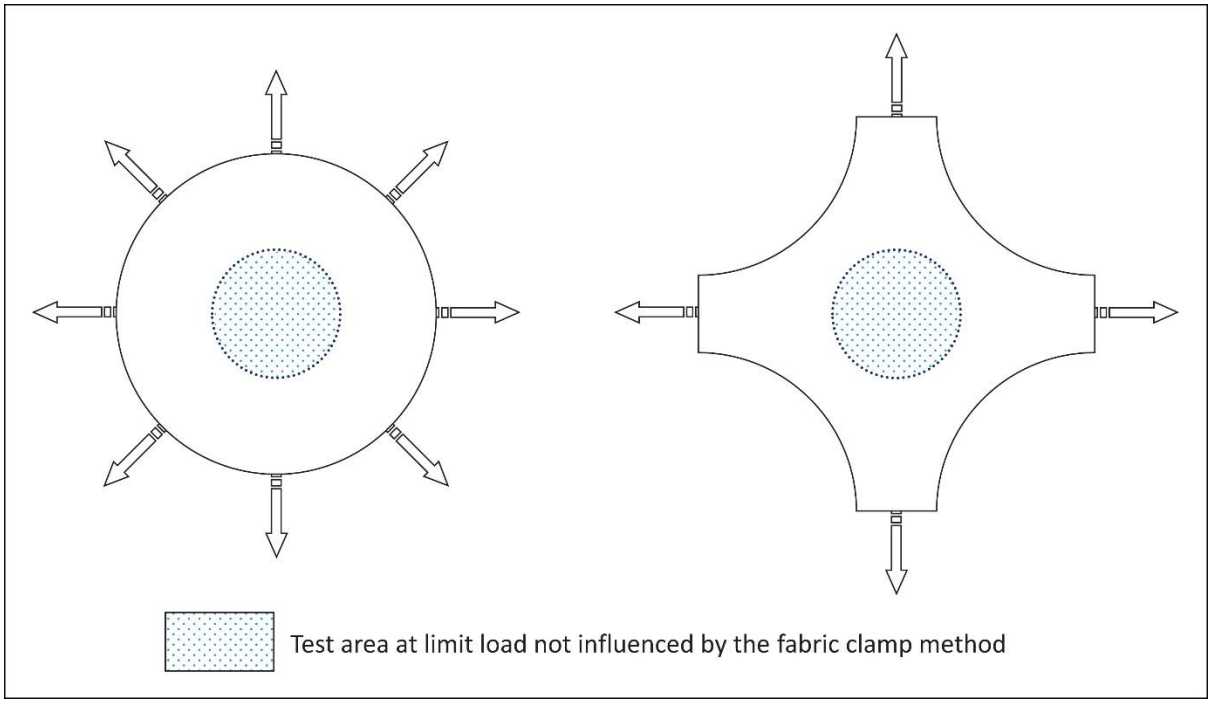
- existing damage that may be undetected during pre-flight inspection, and
- limited damage, inflicted during flight where the size of the damage in itself would not result in a catastrophic failure.

The resistance of envelope fabric to damage propagation is determined by test.

It is shown by test that a crosswise slit of at least 5 cm in the most unfavourable direction to the envelope fabric at the maximum tension experienced in service does not propagate. Test results from tests on similar fabric at the equal or higher tension and damage equal or larger than 5 cm are considered compliant.

A typical test set-up is provided below.

The tension in the test area of the specimen of the fabric should be equal to the maximum tension experienced in service and the test method should not create unacceptable tension re-distributions in the test area when the test is conducted.



If the balloon is equipped with a net to distribute and reduce the loads in the envelope, the net is regarded as a tear-prevention device.

CS 31TGB.47 Precautions against loss of lifting gas

The envelope is designed to exclude the possibility of loss of lifting gas likely to adversely affect safe operation taking into account dynamic pressure, temperature and fluctuations in air pressure over the permissible operating range.

CS 31TGB.49 Limiting the operating pressure

The balloon is equipped with an automatic and/or manual lifting gas release device. The response pressure of an automatic pressure release device is established. The quantity of gas to be released by the pressure release device is large enough to prevent a further increase in pressure. Opening of a pressure relief device is unambiguously indicated to the operator.

AMC1 31TGB.49 Limiting of operating pressure

The envelope pressure is limited to prevent the envelope from bursting. However, the definition of the envelope's maximum operating pressure depends on the design of the tethered gas balloon system. For inflated balloon systems the operating conditions are not limited to flight but also include the parking conditions if the balloon system stays inflated for a prolonged period between the flight operations. Thus, different cases need to be considered:

(a) Balloon systems staying inflated above maximum wind speed for flight operation

These balloon systems ensure envelope tautness by a ballonet or other means of feeding/discharging gas into the envelope when moored on the ground in parking position to withstand the dynamic pressure of considerably high wind speeds. Here the maximum operating pressure is the maximum pressure established by the designer for high wind speeds whilst moored in parking condition to the ground. Under this condition the safety factors in CS 31TGB.25 are applicable. The ascent factor in CS 31TGB.23(b) is however not applicable in the parking position. The response pressure of the automatic lifting gas release valve usually is higher than the maximum operating pressure to prevent the envelope from getting pumped out below dynamic pressure of the wind by unexpected gusts. A factor of not less than 1·4 times the maximum operating pressure during mooring has been shown by practical experience to be applicable.

(b) Balloon systems other than described in (a)

These balloon systems are usually smaller and ensure envelope tautness by means other than described under (a), i.e. by flexible parts in the envelope. They are designed for maximum wind speed during flight operation and will normally be deflated during high wind speed weather conditions. Here the maximum operating pressure is the pressure for flight operation established by the designer. The response pressure of the automatic lifting gas release device is not less than 1·15 times the maximum operating pressure.

For clarification, it should be noted that in a strict sense the automatic pressure release device can only prevent the further rise of pressure for the very moment. After release the device should close again in order to minimise the loss of lifting gas. If after a while the pressure increases again for any reason, the device will also open again. This behaviour is intended and does not impair safety.

CS 31TGB.51 Rapid deflation means

The envelope has a means allowing rapid deflation of the balloon.

AMC1 31TGB.51 Rapid deflation means

Rapid deflation means are used to deflate the envelope in cases like e.g. when:

- wind speeds increase above the wind speed limitations for low mooring;
- required during inflation before attachment of the tether cable; or
- included in emergency procedures for unintended free flight.

Note: The rapid deflation means for low mooring acts automatically when the balloon is not being monitored by an operator.

CS 31TGB.53 Tether system

(a) The suitability, durability, and reliability of the tether system is established for all phases of operating.

(b) In operation and mooring the balloon is securely and reliably anchored to the ground.

(c) Precautions are to be taken to mitigate the risks due to the effect of wind exceeding the maximum wind speed stated in the Flight Manual on the balloon when moored to the ground.

AMC1 31TGB.53(a) Tether system

The suitability, durability, and reliability of the tether system, including the tether control systems, is determined by a Failure Mode Effect Analyses (FMEA) covering all phases of operation.

For components of the tether system (i.e. the winch) compliance with the requirement of CS 31TGB.53(a) can be shown by a certificate from an expert body provided that:

(a) this certificate specifies the conditions for safe operation of the winch that cover the conditions for safe operation of the balloon;

(b) the winch system is capable of safely fulfilling the task of a tethered gas balloon winch;

(c) compliance with the Machinery Directive 2006/42/EC (or equivalent (US) requirements) is the basis for the tethered gas balloon winch system;

(d) modifications to the winch design do not invalidate the applicable requirements from the certificate that remain applicable after the modification.

Note: The overload protection of industrial winches is not applicable in the TGB application because overload cannot occur in a TGB application;

(e) the expert body is an EC-notified organisation which has a certified structure and a proven capability and experience. ‘Certified’ means an approval by the government which requires an organisational structure and entails extended liability. ‘Proven capability’ means successfully managed projects that are reasonably comparable to the balloon winch case. Usually these are cranes, elevators, rides or similar winch technology;

(f) the final report complies with the Annex II of the Machinery Directive 2006/42/EC or US requirement or an acceptable requirement; and

(g) there is an alternative retrieve system which is able to cover a functional failure of the winch.

AMC1 31TGB.53(c) Tether system

An automatic rapid deflation (See CS 31TGB.51) of the balloon in case it breaks away from its low mooring position or any other system that will prevent uncontrolled free flight is an acceptable risk mitigation.

CS 31TGB.59 Gondola

(a) The gondola may not rotate independently of the envelope unless safe operation is assured.

(b) Projecting object in the gondola, that could cause injury to the occupants, are avoided or padded.

(c) A holding grip is provided for each occupant.

(d) Reasonable space is provided for all occupants, with regard to both comfort during the flight and to safety during the landing.

(e) Occupants and items in the gondola are prevented from falling from the gondola.

(f) The gondola occupant securing devices (e.g. doors or harnesses) comply with the following requirements:

(1) The device is closed and locked during flight.

(2) The device is protected against unintentional opening by persons or opening as the result of a mechanical failure during flight.

(2) The device can be opened by occupants and crew.

(3) Operation of the device shall be simple and obvious.

(4) The device has a visual indication that it is properly closed and locked.

AMC1 31TGB.59 Gondola

The requirements for a gondola carrying multiple free-standing persons is complied with when the applicable requirements for the ‘carrier’ provided in the Machinery Directive 2006/42/EC are met.

AMC1 31TGB.59(c) Gondola

A holding grip provides an obvious means for the occupants of the gondola to stabilise themselves during flight. The location or design of occupant securing devices (refer to CS 31TGB.59(f)(1)) is such that they do not invite occupants to use them as holding grip.

AMC1 31TGB.59(d) Gondola

For gondola providing standing space for the occupant, a minimum plan area of 0·3 m^2 is provided for each occupant.

CS 31TGB.65 Night lighting

(a) If the balloon is operated at night, illumination of controls, equipment and essential information is provided for the safe operation of the balloon.

(b) An Anti-Collision light system is installed which complies with the following:

(1) The Anti-Collision light consists of one or more flashing red (or flashing white) light(s) with an effective flash frequency of at least 40, but not more than 140, cycles per minute.

(2) The Anti-Collision light arrangement provides 360° horizontal coverage and at least 60° vertical coverage above and below the horizontal plane.

(3) The Anti-Collision light(s) are mounted on, or suspended from the balloon in order to identify the position of the envelope and gondola during night operation.

(4) At least one Anti-Collision light is visible from a distance between 100 m and 3 700 m (2 NM) at night under clear atmospheric conditions.

(5) The Anti-Collision light system can be switched on/off during flight.

(c) The night lighting will not impair the crews' vision or performance during operation.

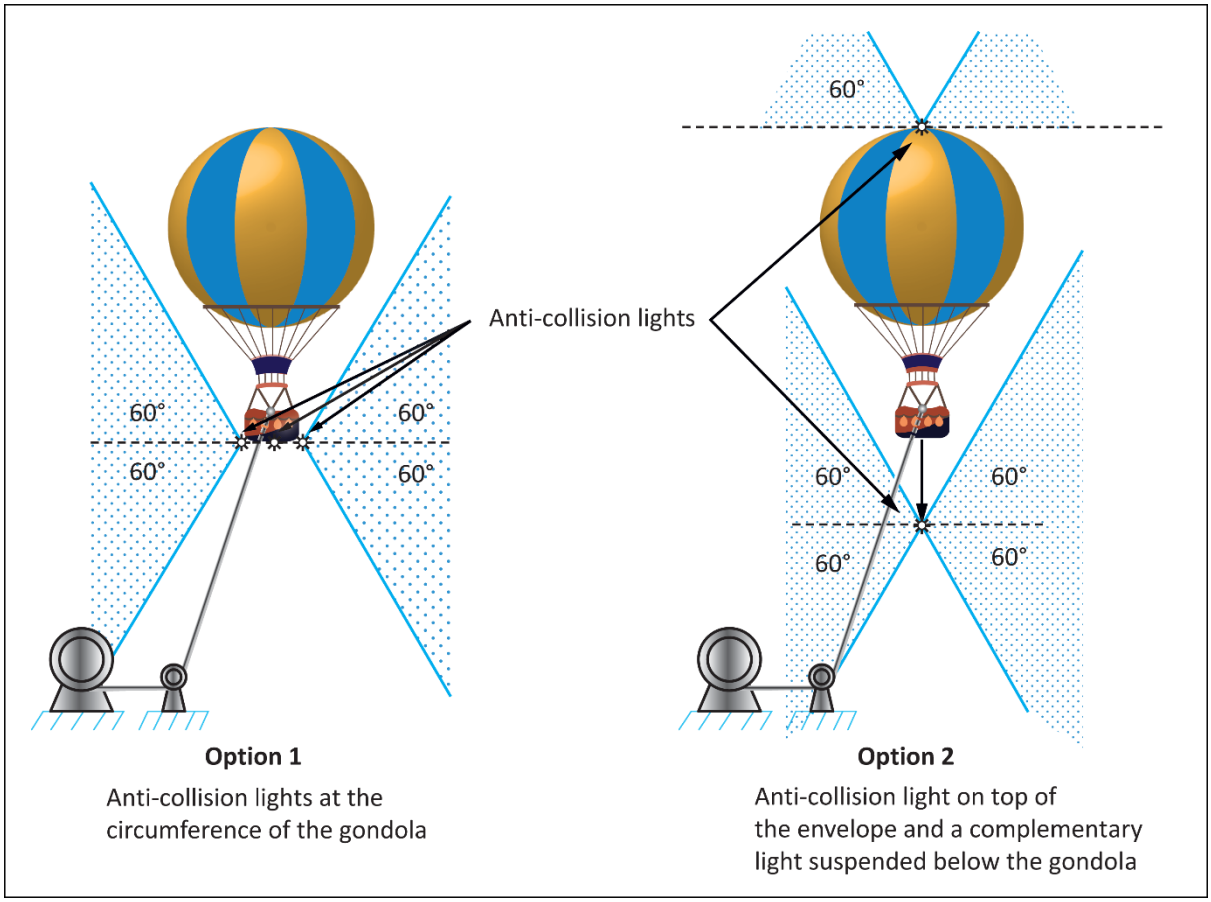
AMC1 31TGB.65(a) Night lighting

A means to provide illumination of the instruments, equipment and controls that are essential for the safe operation of the balloon may be instrument lighting, local lighting or any independent portable (non-handheld) light of sufficient capacity.

It is acceptable that lights can be switch on and off provided that the operator, without undue burden or ambiguity, can switch on the lighting in night conditions.

AMC1 31TGB.65(b) Night lighting

The following two schematics illustrations for anti-collision light arrangements show vertical coverage and positions that meet the requirements of CS 31TGB.65(b)(2) and (3).



The horizontal 360° coverage requirement is applicable to a distance between 100 m and 3 700 m (2 NM). It is acceptable that the light from the anti-collision lights is not visible from positions closer than 100 m horizontally from the balloon.

AMC1 31TGB.65(c) Night lighting

The light from the Anti-Collision light does not directly shine on the crew and passengers and does not create a reflection on the balloon or flare that disturbs the crews' performance.

Lighting level of controls, equipment and instruments are compatible with the crew night vision. This prevents untimely fatigue of the eyesight due to frequent adaptation when looking from bright light into dark night and vice versa.

CS 31TGB.67 On-board power units

If an on-board power unit is used to provide electrical power during operation, the system is designed and installed so as not to create a fire hazard or cause an electrical shock to the occupants.

AMC1 31TGB.67 On-board power units

For this AMC, it is assumed that only power units are used which conform to the state-of-the-art industrial standard. The safe operation of the balloon is not directly dependent on the proper function of the power unit. For all other designs, the Authority is consulted for more detailed requirements.

Power units of industrial standard used on-board of the balloon in addition comply with the following:

(a) General

The power unit is designed and installed so that under all normal operating conditions and reasonably foreseeable in service emergency situations, it does not endanger the aircraft, its occupants, or third parties.

(b) Ventilation

The occupants are accommodated in adequately ventilated areas where:

(1) the carbon monoxide partial pressure does not exceed 1/20 000; and

(2) fuel vapour is not present in harmful concentrations.

(c) Fire extinguishers

(1) Unless the power unit has a fire extinguishing system by itself, there is at least one manual fire extinguisher within reach of an occupant.

(2) The following applies to manual fire extinguishers. The type and quantity of the fire extinguishing substance is appropriate to the fire extinguisher's application area. Fire extinguishers:

(i) conform to EN3 or an equivalent specification acceptable to the Authority;

(ii) have a minimum capacity of 2 kg when using dry powder, unless the capacity is otherwise determined by the applicant; and

(iii) be at least of comparable effect when the extinguishing means is other than ‘dry powder’.

(3) Fire extinguishers in compartments intended for persons are designed to minimise the risk of toxicity caused by use of the fire extinguishing substance.

(d) Gondola

The following applies to the gondola when an on-board power unit is carried:

(1) The material used is at least fire retardant.

(2) Pipes, tanks or equipment that carries fuel, oil or flammable liquids are not to be placed in the gondola unless they are reasonably shielded, insulated, or otherwise protected so that fracture or failure of such parts causes no danger.

(e) Electrical earth connection

(1) In order to prevent the occurrence of potential differences between components of the power unit and other electrically conductive parts of the balloon which cannot be ignored on account of their mass, such conductive parts are conductively interconnected.

(2) The cross-sectional area of bonding connectors, if made from copper, is not less than 1·33 mm^2.

(f) Fire protection for control system and structure

Control systems, suspension units or other structures in the power unit compartment which are added to the design by the applicant are made of fireproof material or shielded to withstand the effect of a fire.

(g) Fire protection

(1) The power unit is adequately separated from the balloon's structure by fireproof bulkheads or ventilated bays.

(2) Areas in which combustible liquids can accumulate as a result of a leaking tank have an adequate drain pipe. Collected leaking liquids cannot reach other locations in and under the craft which pose a potential risk of fire.

(3) Precautionary measures are to be taken to reduce as far as possible the risk of fire as a result of a hard landing of the gondola.

(h) Power unit installation

(1) Each power unit is supported so that the loads resulting from the weight of the unit are not concentrated.

(2) There are pads, if necessary, to prevent chafing between each unit and its supports.

(3) Materials employed for supporting the unit or padding the supporting members are non-absorbent or treated to prevent the absorption of fuel.

(4) Each installation is ventilated and drained to prevent accumulation of flammable fluids and vapours.

(i) Fuel tank expansion space

(1) Each external fuel tank added to the design by the applicant has an expansion space of sufficient capacity, but of not less than 2 % of the

tank capacity, to prevent spillage of fuel onto the surfaces of the power unit and the balloon's structure due to thermal expansion or manoeuvre unless the design of the venting system precludes such spillage.

(2) It is not possible to fill the expansion space inadvertently with the power unit in any normal ground attitude.

(j) Exhaust system, general

(1) The exhaust system ensures safe disposal of exhaust gases without fire hazard or carbon monoxide contamination in any personnel compartment.

(2) Each exhaust system part with a surface hot enough to ignite flammable fluids or vapours is located or shielded so that leakage from any system carrying flammable fluids or vapours will not result in a fire caused by impingement of the fluids or vapours on any part of the exhaust system, including shields for the exhaust system.

(3) All parts of the exhaust system are located sufficiently far from or separated from adjacent parts of the balloon's structure by fireproof shielding.

(4) No exhaust gases will discharge dangerously near any oil or fuel system drain.

(5) Each exhaust system component added to the design by the applicant is ventilated to prevent points of excessively high temperature.

(k) Firewalls

(1) The power unit is isolated from the rest of the balloons structure by a firewall, shroud, or equivalent means.

(2) The firewall or shroud is constructed so that no hazardous quantity of liquid, gas or flame can pass from the power unit compartment to other parts of the balloon.

(3) The firewall and shroud is fireproof and protected against corrosion or deterioration. The following materials are accepted as fireproof, when used in firewalls or shrouds, without being tested:

(i) stainless steel sheet, 0·38 mm thick;

(ii) mild steel sheet (coated with aluminium or otherwise protected against corrosion) 0·5 mm thick;

(iii) steel or copper base alloy firewall fittings.

(4) Other materials such as fire protection paint and/or putty are only used if they conform to the FAA Advisory Circular No. 20-135 or equivalent accepted specifications.

CS 31TGB.68 Master switch arrangement

(a) There is a master switch arrangement to allow ready disconnection of electric power sources from the main bus.

(b) The point of disconnection is adjacent to the sources controlled by the switch.

(c) The master switch or its controls is installed so that the switch is easily discernible and accessible to the operator or occupant.

CS 31TGB.69 Electric cables and equipment

(a) Each electric connecting cable has adequate capacity and is correctly routed, attached and connected so as to minimise the probability of short circuits and fire hazards.

(b) Overload protection is provided for each electrical equipment. No protective device protects more than one circuit essential to flight safety.

(c) Unless each cable installation from the battery to a circuit protective device or master switch, whichever is closer to the battery, is of such power carrying capacity that no hazardous damage will occur in the event of a short circuit, this length of cable is protected or routed in relation to parts of the balloon's structure that the risk of short circuit is minimised.

AMC1 31TGB.69(c) Electric cables and equipment

The risk of short circuit for the electrical cable between battery and master switch is minimised when the unprotected battery to master switch cables, of an adequate capacity, have a maximum length of 0·5 m.

In any event the capacities of protected cables are such that no hazardous damage will occur to the balloon and its occupants, nor its effects to the occupants from the generation of noxious fumes, due to electrical overloading of cables before a circuit protective device will operate.

(SUBPART E — NOT APPLICABLE)

SUBPART F — SYSTEMS AND EQUIPMENT

CS 31TGB.71 Function and installation

(a) Equipment is:

(1) of a kind and design appropriate to its intended function;

(2) labelled as to its identification, function, or operating limitations, or any applicable combination of these factors; and

(3) installed according to limitations specified for that equipment.

(b) Instruments and other equipment do not in themselves, or by their effect upon the balloon, constitute a hazard to safe operation.

(c) The following instruments are installed if required to monitor the operating limitations:

(1) An envelope pressure gauge which displays the limits of permissible internal pressure. The operator is warned by an unambiguous signal if the limit of airborne operating pressure is exceeded.

(2) A temperature measuring device mounted at a point of the envelope that provides a measurement of the operational limitation.

(3) A wind velocity measuring device mounted at the most appropriate point of the envelope.

(4) A load cell at the most appropriate place in order to monitor the tensile force in the tether cable in service.

(5) Device(s) to provide the operational or design limitations information to the operator.

(d) Systems and equipment that need to function properly for safe operation are identified in the operational instructions.

AMC1 31TGB.71(c) Function and installation

An instrument, in the classical sense, houses the sensor and the indicator (e.g. altimeter). However, it should be noted that for tethered gas balloons the sensor and the indicating display may be mounted far away from each other (e.g. sensor on the top; display in the gondola or at the winch). Hence, the word ‘instrument’ may not necessarily mean an integrated system.

The 'most appropriate place' for the instruments required by subparagraph CS 31TGB.71(c)(2) and (c)(3) shall be established in view of accuracy for measuring the values.

AMC1 31TGB.71(d) Function and installation

The correct functioning is not to be impaired by icing, heavy rain, high humidity, or low and high temperatures.

When ATC equipment is installed, it is shown that the electrical system is such that the operation of this equipment is not adversely affected.

The operating instructions provide information regarding systems and equipment essential for safe operation. Restrictions or mitigating actions for inoperative systems or equipment are included in the operating instructions to support continued safe operation if applicable.

CS 31TGB.73 Instrument marking

The following applies to all monitoring instruments:

(a) If the cover glass of the instrument is marked and adequate measures are taken to ensure that the cover glass remains in its correct position relative to the graduated dial.

(b) All markings are sufficiently wide and applied to ensure that they are easily and clearly readable by the operator.

(c) The ranges for analogue indicators are identified as follows:

(1) Normal operating range – green;

(2) Caution area – amber or yellow; and

(3) Permissible maximum or minimum value - red radial line.

(d) For digital indicators, the limits of use are displayed close to the indicator or a red signal is showing when the permissible limits are exceeded.

CS 31TGB.75 Warning, caution, and advisory lights

If warning, caution or advisory lights are installed, these are:

(a) red, for warning lights (lights that indicate a condition that demands immediate corrective action);

(b) amber or yellow, for caution lights (lights that indicate a condition that requires immediate awareness and the possible need for subsequent corrective action);

(c) green, for safe operation lights; and

(d) of any other colour, including white, for lights not described in paragraphs (a) through (c) of this paragraph, provided the colour differs sufficiently from the

colours prescribed in paragraphs (a) through (c) to avoid possible confusion; and

(e) visible under all likely lighting conditions.

SUBPART G — OPERATING LIMITS AND DETAILS

CS 31TGB.81 Flight manual

(a) Operating instructions are provided in a Flight Manual with each balloon.

(b) The Flight Manual contains:

(1) a description of the balloon and its technical equipment with explanatory sketches;

(2) operating limitations, minimum required crew, normal procedures (including mooring, inflation, deflation and tethered flight), emergency procedures, and other relevant information specific to the balloon's operating characteristics and necessary for safe operation. This section of the manual requires approval;

(3) specification of the permissible lifting gas;

(4) information for ground handling, transport and storage; and

(5) site preparation instructions and installation information required for safe operation.

(c) The operating limitations, normal and emergency procedures, and other relevant information specific to the balloon's operating characteristics and necessary for safe operation are provided to the crew.

AMC1 31TGB.81(b)(5) Flight Manual

Site preparation and installation information

(a) The site preparation instructions include:

(1) the magnitudes and x-, y- and z-directions of each load carrying interface between the tether system and the ground;

(2) dimensions and categories of safety areas on the ground and in the air;

(3) the ground condition and its permitted maximum mean slope; and

(4) any additional safety area required by the emergency descent procedure, if applicable.

(b) The installation information includes:

(1) a list of the minimum installation crew and their necessary skills;

(2) a checklist of the necessary tools and devices for installing/de-installing; and

(3) a checklist describing the necessary sequential steps for installation/de-installation. The list highlights the safety critical phases including precautions and mitigating measures.

CS 31TGB.82 Instructions for continued airworthiness

A Maintenance Manual and a maintenance schedule against which the balloon must be inspected and maintained in a serviceable condition is provided with each balloon.

(a) The instructions for Continued Airworthiness include information essential to the Continued Airworthiness of all parts and appliances of the balloon as required by CS-31TGB.

(b) The instructions for Continued Airworthiness are in the form of a manual or manuals as appropriate for the quantity of data provided.

(c) The format of the manual or manuals is provided in a practical arrangement.

(d) The instructions for Continued Airworthiness cover:

(1) detailed description of the balloon and its components, systems and installations;

(2) handling instructions;

(3) basic control and operating information describing how the balloon's components, systems and installations operate;

(4) servicing information;

(5) a maintenance schedule against which the balloon is inspected and maintained;

(6) maintenance and inspection instructions;

(7) repair instructions;

(8) troubleshooting information; and

(9) airworthiness limitations that set forth each mandatory replacement time, inspection interval and related inspection procedure. This section of the manual requires approval.

AMC1 31TGB.82 Instructions for continued airworthiness

Note: The paragraph numbering of this AMC relates to the paragraph numbering of CS 31TGB.82

(c) If instructions for continued airworthiness are not supplied by the manufacturer or designer of parts and appliances installed in the balloon, the instructions for

continued airworthiness for the balloon need to include the information essential to the continued airworthiness of the balloon.

If manuals from different manufacturers are used, they need to provide a practical arrangement.

(d)(1) The detailed description of the balloon and its components needs to include for each balloon:

(1) a description of the systems including the assembly and disassembly instructions;

(2) a parts list covering all construction and equipment components and the assemblies. Where applicable, individual parts need to be numbered so that they can be related to the different assemblies and that their number corresponds to the type plate of the assembly; and

(3) a summary of the materials and consumables used with procurement details.

(d)(5) If applicable, the maintenance schedule may include instructions for continued airworthiness (e.g. recommended inspections or mandatory replacement of parts) to ensure the suitable protection of parts against deterioration or loss of strength, objective pass or fail criteria, e.g. applicable where tolerances need to be provided.

(d)(6) The maintenance and inspection instructions need to provide information for removal and installation, cleaning, inspecting, adjusting, testing and lubrication of systems, parts and appliances of the balloon as required for continued airworthiness. Reference may be made to information from an accessory, instrument or equipment manufacturer as the source of this information if it is shown that the item has an exceptionally high degree of complexity requiring specialised maintenance techniques, test equipment or expertise.

(d)(9) If the instructions for continued airworthiness consist of multiple documents, the Airworthiness Limitations section needs to be included in the principal manual.

CS 31TGB.83 Crew training and training information

For a safe operation of the balloon, a training manual for crew is made available that contains as a minimum the following:

(a) Operating instructions and information as required by CS 31TGB.81;

(b) Minimum crew qualifications;

(c) Minimum training requirements, both theoretical and practical as appropriate;

(d) A method to show proof of successfully completing the training; and

(e) Recommended training requirements.

AMC1 31TGB.83 Crew training and training information

The crew training and training information contains the following aspects when applicable to the operation of the balloon:

(a) general information on the training syllabus (theoretical and practical training) and examination;

(b) description of the system in sufficient detail to understand the principles of the balloon and systems;

(c) environmental conditions and their impact on safe operation;

(d) procedures for:

(1) mooring (high and low);

(2) flying;

(3) inflation and deflation; and

(4) emergency procedures;

(e) weather;

(f) maintenance; and

(g) record keeping.