

# Democratic Socialist Republic of Sri Lanka



## Civil Aviation Authority of Sri Lanka

### Implementing Standards

(Issued under Sec. 120, Civil Aviation Act No. 14 of 2010)

### Title: Manned Hot Air Balloons

Reference No. : IS 8-(ii)-3

SLCAIS : 093

Date: 07.03.2018

Pursuant to Sec.120 of the Civil Aviation Act No.14 of 2010 which is hereinafter referred to as the CA Act, Director General of Civil Aviation shall have the power to issue, whenever he considers it necessary or appropriate to do so, such Implementing Standards for the purpose of giving effect to any provision in the CA Act, Requirements or Rules made thereunder including the Articles of the Convention on International Civil Aviation specified in the Schedule to the CA Act.

Accordingly, I, being the Director General of Civil Aviation do hereby issue the Implementing Standards on **Manned Hot Air Balloons** as mentioned in the Attachment hereto (Ref: Attachment No. IS-8-(ii)-3-Att.), elaborating the requirements to be satisfied for the effective implementation of the International Standards and Recommended Practices on contained in Annex 8, Part II, Chapter 3 to the Convention and the Air Navigation Regulations of 1955.

This Implementing Standard shall be applicable to all Hot Air Balloon Operators Approved by the Director General of Civil Aviation of Sri Lanka and shall come in to force with immediate effect and remain in force unless revoked and it will supersede the requirement in Aviation Safety Notice (ASN) 27.

Attention is also drawn to Sec. 49 and Sec. 103 of the Act, which states inter alia that failure to comply with Implementing Standard is an offence.

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Director General of Civil Aviation and  
Chief Executive Officer

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Enclosure: Attachment No IS-8-(ii)-3-Att.

## **Implementing Standards**

### **SLCAIS – 093: MANNED HOT AIR BALLONS**

#### **1. GENERAL**

This IS comprises minimum requirements and constitutes the basis for the DGCA to issue Certificate of Airworthiness or changes to those certificates, as required for the operations of Hot Air Balloons in Sri Lanka. The required standards are explained under the following subparts.

1. Applicability
2. Flight Requirements
3. Strength Requirements
4. Design and Construction
5. Operating Limitations and Information

#### **2. APPLICABILITY**

- a) This IS prescribes airworthiness standards for the issue of Certificate of Airworthiness and changes to those certificate, Hot Air Balloons.
- b) Each person who applies for a certificate or change must show compliance with the applicable requirements of this IS
- c) For the purposes of this IS-
  - 1) Captive gas balloon is a balloon that derives its lift from a captive lighter than air gas;
  - 2) A hot air balloon is a balloon that derives its lift from heated air;
  - 3) The envelope is the enclosure in which the lifting means is contained;
  - 4) The basket is the container, suspended beneath the envelope, for the balloon occupants;
  - 5) The trapeze is a harness or is a seat consisting of a horizontal bar or platform suspended beneath the envelope for the balloon occupants; and
  - 6) The design maximum weight is the maximum total weight of the balloon, less the lifting gas or air.

#### **3. FLIGHT REQUIREMENTS**

##### **Weight Limits**

The range of weights over which the balloon may be safely operated must be established  
Maximum Weight: The maximum weight is the highest weight at which compliance with each applicable requirements of this IS is shown  
Empty Weight: The empty weight is the weight of the Balloon with installed equipment but without lifting gas or heater fuel

##### **Unpremeditated descents**

Procedures must be established and published in the Flight Manual for arresting unpremeditated fast descents and for hard landings.

## **Controllability**

The applicant must show that the balloon is safely controllable and maneuverable during take-off, ascent, descent and landing without requiring exceptional piloting skill.

## **4. STRENGTH REQUIREMENTS**

### **Loads**

Strength requirements are specified in terms of limit loads that are the maximum load to be expected in service, and ultimate loads, that are limit loads multiplied by prescribed factors of safety. Unless otherwise specified, all prescribed loads are limit loads.

### **Strength**

- a) The structure must be able to support limit loads without detrimental effect
- b) The structure must be substantiated by test to be able to withstand the ultimate loads for at least three seconds without failure. For envelop, a test of a representative part is acceptable, if the part tested is large enough to include critical seams, joints and load attachment points and members.
- c) The basket or crew carrying system must be generally robust and must afford adequate protection to all occupants during a rough landing. There must be no design feature, which by distortion or failure would be likely to cause serious injury to the occupants.

## **5. DESIGN AND CONSTRUCTION**

### **General**

The suitability of each design detail or part that bears on safety must be established by tests or analysis.

### **Materials**

- a) The suitability and durability of all materials must be established on the basis of experience, acceptable to the DGCA or tests. Materials must conform to acceptable specifications that will ensure that they have the strength and other properties assumed in the design data.
- b) Reputable commercial material design data may be acceptable subject to an additional reserve factor
- c) Envelope materials must be shown not to support continued burning if ignited by the heater when the balloon is inflated or in flight.

### **Fastenings**

Only approved bolts, pins, screws and rivets may be used in the structure. Approved locking devices or methods must be used for all these bolts, pins and screws unless the installation is shown to be free from vibration. Self-locking nuts may not be used on bolts that are subject to rotation in service.

## **Inspection Provisions**

There must be a means to allow close examination of each part that requires repeated inspection and adjustment.

## **Fuel Cells**

If fuel cells are used the attachments and related supporting structure must be able to withstand with failure any inertia loads to which the installation may be subjected.

## **Pressurized fuel systems**

For pressurized fuel systems each element, including the lines and connecting fittings, 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 fail or malfunction. All parts of a pressurized fuel system must be robust and capable of withstanding impact loads that are likely in service. In particular no part of the system may have an unprotected rigid extension which could be broken by a likely impact load.

## **Heaters**

- a) If a heater is used to provide the lifting means, the system must be designed and installed so as not to create a fire hazard.
- b) Parts adjacent to the burner flame and the occupants must be protected from excessive heat.
- c) There must be controls, instruments, or other equipment essential to the safe control and operation of the heater acceptable to the
- d) DGCA, they must be shown to be able to perform their intended functions during normal and emergency operation.

## **Ballast**

Each captive gas balloon must have a means for the safe storage and controlled release of ballast. The ballast must consist of material that, if released during flight, is not hazardous to persons on the ground.

## **Drag Rope**

If a drag rope is used, the end that is released over-board must be stiffened to preclude the probability of the rope becoming entangled with trees, wires, or other objects on the ground.

## **Deflation means**

There must be a means to allow emergency deflation of the envelope so as to allow a safe emergency landing. The system must be designed to prevent the possibility of inadvertent operation. If a system other than a manual system is used, the reliability of the system used must be substantiated.

## **Rip Cords**

- a) If a ripcord is used for emergency deflation; it must be designed and installed to preclude entanglement.

- b) The force required to operate the ripcord may not be less than 25 pounds or more than 75 pounds.
- c) The end of the ripcord to be operated by the pilot must be coloured red.
- d) The ripcord must be long enough to allow an increase of at least 10% in the vertical dimension of the envelope.

### **Trapeze, basket or other means provided for occupants**

Each projecting object on the trapeze, basket or other means provided for carrying occupants that could cause injury to the occupants, must be padded.

### **Safety belts**

- a) There must be a safety belt, harness, or other restraining means for each occupant, unless the Certificating Authority finds it unnecessary. If installed, the belt harness, or other restraining means and its supporting structure must meet the strength requirements stated in this IS under Strength Requirements
- b) Safety belts or harnesses are not required on baskets or gondolas, but baskets or gondolas must incorporate handholds of adequate strength and numbers.

### **Position lights**

The Rules of the Air and other operational legislation should be followed.

## **6. OPERATING LIMITATIONS AND INFORMATION**

### **General**

The operating limitations, normal and emergency procedures, and other pertinent information peculiar to the balloon's operating characteristics and necessary for safe operation must be provided by the manufacturer by a balloon flight manual furnished with each balloon, or by a placard or marking

On the balloon that is clearly visible to the operator. The operating limitations must include the maximum certificated weight.

### **Instructions for continued airworthiness**

The applicant must provide a maintenance manual for the balloon and a maintenance schedule against which the balloon must be inspected and maintained in a serviceable condition

### **Required basic equipment**

- 1) An altimeter
- 2) A fuel quantity gauge or other means (such as isolated tanks which can be used in sequence), which enable the pilot to know his fuel quantity, remains.
- 3) An envelope temperature indicator which may either be of the continuous reading type or a type which gives a warning signal.