



Department of Civil Aviation - Sri Lanka

**AVIATION SAFETY NOTICE**

ASN 027

Ref. No: ASN/GEN/2002/13

To: All Operators of Hot Air Balloons in Sri Lanka, Subscribers

1. Subject : Manned Hot Air Balloons
2. Nature : Advisory
3. Issue No. : 01
4. Status : New
5. Effective Date : 20 December 2002
6. Validity: Until further notice
7. Contact person: Airworthiness Division of the Department of Civil Aviation
8. Availability : A copy of this document is available for reference at the Library, Department of Civil Aviation, 64, Galle Road, Colombo 3.
9. Applicability : All operators of Hot Air Balloons in Sri Lanka
10. Comments : Comments (if any) on the contents of any ASN may be forwarded to the contact person. However the ASN will come into effect on the date shown in the ASN notwithstanding any objection or comment made by any party unless and until an amending ASN is issued afresh by this office.
11. Notice :  
**GENERAL** : This ASN comprises minimum requirements and constitutes the basis for the DCA to issue Certificates 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.

- 11.1 Applicability
- 11.2 Flight Requirements
- 11.3 Strength Requirements
- 11.4 Design and Construction
- 11.5 Operating Limitations and Information

**11.1 APPLICABILITY**

- (a) This ASN prescribes airworthiness standards for the issue of Certificates of Airworthiness and changes to those certificates, for Hot Air Balloons.
- (b) Each person who applies for a certificate or change must show compliance with the applicable requirements of this ASN
- (c) For the purposes of this ASN –
  - (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.

## 11.2 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 requirement of this ASN 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.

## 11.3 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 the envelope, 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.



## 11.4 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 Director-General of Civil Aviation 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 without failure any inertia loads to which the installation may be subjected.

### Pressurized fuel systems

For pressurised 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 pressurised 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) Director-General of Civil Aviation. 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 ASN 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.



## 11.5 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.

12. Action required : The above defined standards to be fulfilled by the applicant to operate the hot air balloons in Sri Lanka air space.

13. Checklist : Not Applicable.

H.M.C.Nimalsiri,  
Acting Director General of Civil Aviation

Department of Civil Aviation, ( P.O.Box 535 ) 64, Galle Road, Colombo 03.