

## Certification Memorandum

# CS-31HB Hot Air Balloons: Classification of design changes

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Regulatory requirement(s): 21.A.91, GM 21.A.91

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## Log of issues

Issue	Issue date	Change description
Issue 01	18.01.2021	First issue.

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## 1. Introduction

### 1.1. Purpose and scope

The purpose of this Certification Memorandum is to provide specific guidance for the classification, according to point 21.A.91, of changes to type-certificate of hot air balloons certified according to CS-31HB.

### 1.2. Applicability

This Certification Memorandum is applicable for Design Organisations that develop changes to hot air balloons.

Changes classified as Minor Change can also be applied for by any natural or legal person (point 21.A.92(b)).

### 1.3. Abbreviations

APDOA	Alternative Procedures to DOA to demonstrate design capabilities
AMC	Acceptable Means of Compliance
DOA	Design Organisation Approval
EU	European Union
CM	Certification Memorandum
GM	Guidance Material
RMTOM	Reduced Maximum Take-Off Mass
RV	Rotation Vent (turning vent)
MM	Maintenance Manual
TC	Type Certificate
3D	Three-Dimensional

## 2. Background

Point 21.A.91 reads as follows:

Changes to a type-certificate are classified as minor and major. A “minor change” has no appreciable effect on the mass, balance, structural strength, reliability, operational characteristics, operational suitability data, or other characteristics affecting the airworthiness of the product or its environmental characteristics. Without prejudice to point 21.A.19, all other changes are “major changes” under this Subpart. Major and minor changes shall be approved in accordance with points 21.A.95 or 21.A.97, as appropriate, and shall be adequately identified.’ This CM addresses guidance for the application of point 21.A.91, specifically for the classification of changes to hot air balloons. It follows the same philosophy as GM 21.A.91 by providing a list of examples of changes and their point 21.A.91 classification for hot air balloons.

## 3. EASA Certification Policy

Changes to hot air balloons should be classified as follows in accordance with point 21.A.91:

Item	Scope of the design change	Classification	Possibility to obtain privilege as per 21.A.263
1.	Introduction of new envelope exceeding previously EASA approved volumes by more than 10%	Major	N/A
2.	Introduction of a new envelope within previously EASA approved volumes by the TC holder (e.g. introduction of new 5000m <sup>3</sup> and already existing 3400m <sup>3</sup> and 8000m <sup>3</sup> are EASA approved)	Major	21.A.263(c)(8)
3.	Addition of inflated artwork, e.g. 3D	Major	21.A.263(c)(8)(9)
4.	Introduction of a new Special Shape envelope by the TC holder.	Major	21.A.263(c)(8)
5.	Change of a panel pattern without changing the basic curvature, load tape distances and isotropic fabric	Minor	21.A.263(c)(2)
6.	Introduction of a new deflation system or rotation vent	Major	21.A.263(c)(8)(9)
7.	Changing the rotation vent position due to artwork, not invalidating the assumptions of the initial certification	Minor	21.A.263(c)(2)
8.	Changes to parachute or fast deflation system components (e.g. exchange of pulleys, change of a pulley position, maintaining operating forces and function, ropes, etc.)	Minor	21.A.263(c)(2)
9.	Changes to parachute or fast deflation system (e.g. increase of parachute size)	Major	21.A.263(c)(8)(9)
10.	Changing flying wire length for envelopes smaller than 3 400 m <sup>3</sup>	Minor	21.A.263(c)(2)
11.	Changing flying wire length for envelopes bigger than 3 400 m <sup>3</sup>	Major	21.A.263(c)(8)(9)
12.	Change in scoop or skirt size	Minor	21.A.263(c)(2)
13.	Customization of basket size to fit existing trailer. This change is not suitable to increase floor area for additional occupants and is limited to max. 10 cm.	Minor	21.A.263(c)(2)
14.	Change of the basket wicker work, not invalidating the assumptions of the initial certification. A non-exhaustive list would be location of footsteps, artistic pattern, weight savings.	Minor	21.A.263(c)(2)
15.	Installation of components significantly affecting construction of a basket or operational procedures (e.g. door, seat, movable partition, lights for night VFR)	Major	N/A
16.	Compatibility of approved doors, seats, movable partitions or lights for night VFR and their modification in individual serial numbers due to customer requests, not invalidating the assumptions of the initial certification.	Minor	21.A.263(c)(2)



Item	Scope of the design change	Classification	Possibility to obtain privilege as per 21.A.263
17.	Change in the number of compartments and occupancy of the baskets within limits of previous approved EASA designs under the same TC/STC.	Major	21.A.263(c)(8)(9)
18.	Introduction of new baskets, maintaining design principles and number of occupants within limits of previous approved EASA designs under the same TC/STC.	Major	21.A.263(c)(8)(9)
19.	Introduction of new baskets, exceeding the number of occupants of previous approved EASA designs under the same TC/STC.	Major	N/A
20.	Reducing MTOM (RMTOM)	Minor	21.A.263(c)(2)
21.	Change of the configuration of burner jet nozzles, not adversely affecting burner performance	Minor	21.A.263(c)(2)
22.	Changes to the burner and introduction of new burners, not using other manufacturers' equipment	Major	21.A.263(c)(8)(9)
23.	Changes to the burner frame, which do not adversely affect the primary structure of the balloon (e.g. change in heatshields, aesthetic changes, burner mountings, additional attachments, local reinforcements)	Minor	21.A.263(c)(2)
24.	Changes to the primary structure of the burner frame	Major	21.A.263(c)(8)(9)
25.	Change of fuel cylinder equipment, e.g. valves, pressure gauge, fuel hose connector etc.	Major	21.A.263(c)(8)(9)
26.	Change to the fuel hose type, e.g. material, supplier, pressure rating	Major	21.A.263(c)(8)(9)
27.	Introduction of new hose end fittings	Major	21.A.263(c)(8)(9)
28.	Change of an attachment principle of the fuel cylinder	Major	21.A.263(c)(8)(9)
29.	Change to the operating limitation, e.g. MTOM, number of occupants, maximum windspeed, etc.	Major	N/A
30.	Change to the airworthiness limitations, e.g. mandatory replacement time, inspection interval and related inspection procedure	Major	N/A
31.	Change of Maintenance Manual other than Airworthiness Limitation	Minor	21.A.263(c)(2)
32.	Change to Normal and Emergency Procedure other than editorial changes	Major	21.A.263(c)(8)(9)



Item	Scope of the design change	Classification	Possibility to obtain privilege as per 21.A.263
33.	Change to approved combination of envelope, basket and heater system, e.g. using other manufacturer's equipment	Major	21.A.263(c)(8)(9)
34.	Change in basic materials, for example wicker to composite basket or nylon to polyester fabric.	Major	21.A.263(c)(8)(9)
35.	Change of a construction principle of primary construction components, e.g. inflated baskets, novel envelope structure.	Major	N/A
36.	Change to the primary load path	Major	21.A.263(c)(8)(9)
37.	Influence on the technical data in TCDS (note for editorial changes and updates to include new envelopes or baskets the process below applies)	Major	N/A

The fourth column 'Possibility to obtain privilege as per 21.A.263 indicates those major changes that could be eligible to be approved by a DOA holder under a 21.A.263(c)(8) or 21.A.263(c)(9) privilege if a DOA holders applies for such privilege, demonstrates that the eligibility criteria in section 2.1 of **AMC No 1 to 21.A.263(c)(5), (8) and (9) are met** and follows the process as described in the AMC No. 1 and 2 to **21.A.263(c)(5), (8) and (9)**.

As alternative to AMC No 1 to 21.A.263(c)(5), (8) and (9) Scope and criteria, the TCDS may be updated, due to the simple and specific design of Hot Air Balloons, as well as the limited associated safety risk, following the below process:

1. after approval of the major change under a 21.263(c)(8) privilege, the DOA holder sends a draft amended TCDS to EASA ([generalaviation@easa.europa.eu](mailto:generalaviation@easa.europa.eu)) together with the approval, statement of compliance and the request to update the TCDS.
2. After EASA acceptance, the TCDS update will be published.

#### 4. Remarks

1. Suggestions for amendment(s) to this EASA Certification Memorandum should be referred to the Certification Policy and Planning Department, Certification Directorate, EASA. E-mail [CM@easa.europa.eu](mailto:CM@easa.europa.eu).
2. For any question concerning the technical content of this EASA Certification Memorandum, please contact:  
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