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[4910-13]

## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 31

**[Docket No. FAA-2018-0566; Notice No. 31-002-SC]**

**Special Conditions: Ultramagic S.A., Model M-56, M-56C, M-65, M-65C, M-77, M-77C, M-90, M-105, M-120, M-130, M-145, M-160, N-180, N-210, N-250, N-300, N-355, N-425, S-70, S-90, S-105, S-130, S-160, T-150, T-180, T-210, V-56, V-65, V-77, V-90, and V-105 Balloons;**

#### **Balloon Passenger Basket, Model CV-08, Seat Installation**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final special conditions.

**SUMMARY:** These special conditions are issued for Ultramagic S.A. Models M-56, M-56C, M-65, M-65C, M-77, M-77C, M-90, M-105, M-120, M-130, M-145, M-160, N-180, N-210, N-250, N-300, N-355, N-425, S-70, S-90, S-105, S-130, S-160, T-150, T-180, T-210, V-56, V-65, V-77, V-90, and V-105 balloons. These balloons will have novel or unusual design features associated with a standard construction basket with a singular distribution that includes four occupant seats and a lower sidewall. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for these design features. These special conditions contain the additional safety standards the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

**DATES:** These special conditions are effective [INSERT DATE OF PUBLICATION IN FEDERAL REGISTER].

**FOR FURTHER INFORMATION CONTACT:** Robert Stegeman, FAA, AIR-691, Policy & Innovation Division, Small Airplane Standards Branch, Aircraft Certification Service, 901 Locust; Kansas City, Missouri 64106; telephone (816) 329-4140; facsimile (816) 329-4090.

**SUPPLEMENTARY INFORMATION:**

**Background**

On August 4, 2016, Ultramagic S.A. (Ultramagic) applied for a change to Type Certificate (TC) No. B02CE<sup>1</sup> to include new basket Model no. CV-08 for balloon Models M-56, M-56C, M-65, M-65C, M-77, M-77C, M-90, M-105, M-120, M-130, M-145, M-160, N-180, N-210, N-250, N-300, N-355, N-425, S-70, S-90, S-105, S-130, S-160, T-150, T-180, T-210, V-56, V-65, V-77, V-90, and V-105. The CV-08 basket consists of a traditionally constructed basket, but incorporates seats with restraints and trays for all passengers, as well as a lower basket sidewall to offer a panoramic view for passengers. The CV-08 basket will be matched with one of the balloon envelopes associated with the balloon models listed in these special conditions. The volume of hot air, gores, maximum diameter, and total height defines the balloon envelope.

Most balloon baskets accommodate standing passengers. The CV-08 differs by incorporating passenger seats, restraints, and a lower basket sidewall. Due to the lower sidewall and seat configuration, passengers would need to remain seated and restrained with safety belts during flight. This configuration should consider the static strength of the installations, the possible loads in an accident, and the effect on passenger safety. Accident impact should consider safety comparison between a restrained, sitting occupant; and a normal, standing occupant. Safety requirements for balloon-seated occupants are not included in the existing

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<sup>1</sup> See <http://rgl.faa.gov/>.

airworthiness regulations. These special conditions evaluate the seat installations and restraints using methods consistent with special conditions issued by the European Aviation Safety Agency (EASA). The EASA special conditions are based upon a German standard for seats in hot air airships.

### **Type Certification Basis**

Under the provisions of § 21.101, Ultramagic must show that the M-56, M-56C, M-65, M-65C, M-77, M-77C, M-90, M-105, M-120, M-130, M-145, M-160, N-180, N-210, N-250, N-300, N-355, N-425, S-70, S-90, S-105, S-130, S-160, T-150, T-180, T-210, V-56, V-65, V-77, V-90, and V-105 balloon models—coupled with the CV-08 basket—continues to meet the applicable provisions of the regulations incorporated by reference in TC No. B02CE or the applicable regulations in effect on the date of application for the change. The regulations incorporated by reference in the type certificate are commonly referred to as the "original type certification basis." The regulations incorporated by reference in TC No. B02CE are as follows:

14 CFR 21.29 and part 31, effective on January, 1990, as amended by 31-1 through 31-5 inclusive.

Equivalent level of Safety findings per provision of 14 CFR 21.21(b)(1):

ACE-08-15 of August 1, 2008, Burners, 14 CFR 31.47(d)

ACE-08-15A of November 05, 2013, Burners, 14 CFR 31.47(d), for Model S-70

Special Conditions 31-001-SC applicable to MK-32 model burners.

If the Administrator finds that the applicable airworthiness regulations (i.e., 14 CFR part 31) do not contain adequate or appropriate safety standards for the balloon models listed in these special conditions because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

Special conditions are initially applicable to the model(s) for which they are issued. Should the type certificate for that model be amended later to include any other model that incorporates the same or similar novel or unusual design feature, or should any other model already included on the same type certificate be modified to incorporate the same or similar novel or unusual design feature, the FAA would apply these special conditions to the other model under § 21.101.

The FAA issues special conditions, as defined in 14 CFR 11.19, in accordance with § 11.38, and they become part of the type-certification basis under § 21.101.

### **Novel or Unusual Design Features**

The M-56, M-56C, M-65, M-65C, M-77, M-77C, M-90, M-105, M-120, M-130, M-145, M-160, N-180, N-210, N-250, N-300, N-355, N-425, S-70, S-90, S-105, S-130, S-160, T-150, T-180, T-210, V-56, V-65, V-77, V-90, and V-105 balloon models coupled with a CV-08 basket will incorporate the following novel or unusual design features:

Occupant seats with restraints and a lowered basket side rail.

### **Discussion**

Neither the FAA's airworthiness standards (14 CFR part 31, amendment 31-5), nor EASA's current Certification Specification (CS) for Hot Air Balloons (CS 31HB, amendment 1), incorporate specific requirements for seat and seat belts.

EASA previously published a proposed special condition<sup>2</sup> (now expired) for seats and seat belts for hot air balloon baskets. EASA based the requirements of its proposed special condition on the German airworthiness requirements for Hot Air Airships LFHLLS<sup>3</sup>, incorporating hot air

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<sup>2</sup> Ref EASA Proposed Special Condition, “Seats and seat belts for hot air balloons,” Issue 1, dated October 3, 2014.

<sup>3</sup> LFHLLS (Lufttüchtigkeitsforderungen für Heißluft-Luftschiffe)—Airworthiness Requirements for Hot Air Ships, issued November 13, 1997, amended March 10, 1998, Germany.

balloon basket requirements for seats, seat belts, and the loads in an emergency landing condition, similar to hot air airship requirements. Ultramagic's change application applied the language in the EASA proposed special condition for CS 31HA.14(c), "Occupant mass," CS 31HA.43(d), "Fitting factor," CS 31HA.561(a) and (b)(1), "Emergency landing conditions—General," and CS 31HA.785(a), (c), and (d), "Seats and seat belts" to the CV-08 basket. The FAA finds that these standards are appropriate for a seated, restrained occupant.

### **Discussion of Comments**

Notice of proposed special conditions No. 31-18-01-SC for the Ultramagic Balloon Models M-56, M-56C, M-65, M-65C, M-77, M-77C, M-90, M-105, M-120, M-130, M-145, M-160, N-180, N-210, N-250, N-300, N-355, N-425, S-70, S-90, S-105, S-130, S-160, T-150, T-180, T-210, V-56, V-65, V-77, V-90, and V-105 was published in the Federal Register on June 25, 2018 (83 FR 29472). No comments were received, and the special conditions are adopted as proposed.

### **Applicability**

As discussed above, these special conditions are applicable to the Model M-56, M-56C, M-65, M-65C, M-77, M-77C, M-90, M-105, M-120, M-130, M-145, M-160, N-180, N-210, N-250, N-300, N-355, N-425, S-70, S-90, S-105, S-130, S-160, T-150, T-180, T-210, V-56, V-65, V-77, V-90, and V-105 balloons. Should Ultramagic apply at a later date for a change to the type certificate to include another model incorporating the same novel or unusual design feature, the FAA would apply these special conditions to that model as well.

### **Conclusion**

This action affects only certain novel or unusual design features on the balloon models specified in these special conditions. It is not a rule of general applicability and it affects only the applicant who applied to the FAA for approval of these features on the airplane. These special

conditions are identical in intent to the EASA special conditions, although the formatting has been altered to meet these special condition requirements.

## **List of Subjects in 14 CFR Part 31**

Aircraft, Aviation safety.

The authority citation for these special conditions is as follows:

**Authority:** 49 U.S.C. 106(g), 40113, 44701-44702, 44704.

## **The Special Conditions**

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type certification basis for Ultramagic S.A. Model M-56, M-56C, M-65, M-65C, M-77, M-77C, M-90, M-105, M-120, M-130, M-145, M-160, N-180, N-210, N-250, N-300, N-355, N-425, S-70, S-90, S-105, S-130, S-160, T-150, T-180, T-210, V-56, V-65, V-77, V-90, and V-105 balloons with a basket Model no. CV-08.

### **1. Hot Air Balloon Crashworthiness Requirements for Seat Installations and Restraints for Seated and Restrained Occupants.**

#### **a. Occupant Mass**

For calculation purposes, it should be assumed the mass of an occupant is at least 86 kilograms (190 pounds).

#### **b. Seats, Safety Belts, and Harnesses Factor of Safety**

For each seat, safety belt, and harness, its attachment to the structure must be shown, by analysis, tests, or both, to be able to withstand the inertia forces prescribed in paragraph (c) of these special conditions multiplied by a fitting factor of 1.33.

c. *Emergency Landing Conditions—General*

The balloon—although it may be damaged under emergency landing conditions—must be designed to give each occupant every reasonable chance of avoiding serious injury in a crash landing—when seat belts provided for in the design are properly used—and the occupant is subject to the following ultimate inertia forces acting relative to the surrounding structure as well as independently of each other.

- (1) Forward 6g
- (2) Sideways 6g
- (3) Downward 6g

d. *Seats and Seatbelts*

(1) Each seat and its supporting structure must be designed for an occupant mass in accordance paragraph (a) of these special conditions and for the maximum load factors corresponding to the specified flight and ground load conditions, including the emergency landing conditions prescribed in paragraph (c) of these special conditions.

(2) Each seat or berth shall be fitted with an individual approved seat belt or harness.

(3) Seat belts installed on the balloon must not fail under flight or ground load conditions or emergency landing conditions in accordance with paragraph (c) of these special conditions, taking into account the geometrical arrangement of the belt attachment and the seat.

Issued in Kansas City, Missouri, on August 23, 2018.

Pat Mullen

Manager, Small Airplane Standards Branch

Aircraft

Certification

Service

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