Proposed Special Condition
for Installation of a Ballistic Recovery System on CS-VLA

Introductory note:

The following Special Condition has been classified as an important Special Condition and as such shall be subject to public consultation, in accordance with EASA Management Board decision 02/04 dated 30 March 2004, Article 3 (2.) of which states:
"2. Deviations from the applicable airworthiness codes, environmental protection certification specifications and/or acceptable means of compliance with Part 21, as well as important special conditions and equivalent safety findings, shall be submitted to the panel of experts and be subject to a public consultation of at least 3 weeks, except if they have been previously agreed and published in the Official Publication of the Agency. The final decision shall be published in the Official Publication of the Agency."

Statement of Issue:

This special condition is intended being issued to become part of the type certification basis of airplanes certified against CS-VLA when having a Ballistic Recovery Systems installed.
At the time being special conditions as airworthiness requirements exist only for Part 23 aircraft types as well as for Ultra Light aircraft (UL). For VLAs this is the first time that an applicant applied for this design feature. The comparison of both of these existing set of requirements proved that the more stringent requirements for Part 23 aircraft are appropriate for VLA after necessary adoption.
It is important to know that the installation and use of a BRS is not intended to compensate any other airworthiness requirements of CS-VLA.

SPECIAL CONDITION

Installation of a Ballistic Recovery System on CS-VLA

1. Flight Test Demonstration

(a) The system must be demonstrated in flight as defined in (b) to satisfactorily perform its intended function, without exceeding the system deployment design loads, for the critical flight conditions.

(b) Satisfactory deployment of the parachute must be demonstrated, at the most critical airplane mass and balance, for the following flight conditions:

(1) Spin with deployment at one turn or 3 seconds, whichever is longer and

(2) Deployment during level flight with at least V_A at MTOM.

(c) If compliance has not been demonstrated in acc. with paragraph (a) a placard in view of all occupants has to state that the rescue system has not been tested in flight.

2. Occupant Restraint

The occupant restraint system must protect the occupants from head and upper torso injuries during parachute deployment and ground impact at the critical load conditions.

3. Parachute Performance

(a) The parachute must comply with the applicable requirements of ETSO-C23d, or an approved equivalent, for the maximum airplane mass used for compliance with paragraph 1(b)(2).

(b) The ultimate design load used for compliance for the attaching structure and the cabin structure surrounding the occupants must be at least 1.5 times the loads occurring during deployment of the BRS.

(c) It must be shown that, although the airplane structure may be damaged, the airplane impact during touchdown will result in an occupant environment in which serious injury to the occupants is improbable**.**

(d) It must be shown that, with the parachute deployed, the airplane can impact the ground under wind conditions on the ground up to 15 knots, without endangering the airplane occupants. The influence of rain and/or snow has to be considered.

4. System Function and Operations

(a) It must be shown that there is no fire hazard associated with activation of the BRS.

(b) The system must be shown to perform its intended function with a high probability that it will operate as designed.

(c) It must be shown that reliable and functional deployment in the adverse weather conditions that the airplane is approved for have been considered.

(d) It must be shown that arming and activating the system can only be accomplished in a sequence that makes inadvertent deployment extremely improbable.

(e) It must be demonstrated that the system can be activated without difficulty by various sized people, from a 10th percentile female to a 90th percentile male, while sitting in the pilot or copilot seat.

(f) The compression load measured between the pelvis and the lumbar spine of the ATD may not exceed 680 kg (1 500 lb).

(g) For Emergency landing conditions an installed BRS does not provide relief from compliance with the requirements of CS VLA.561.

In addition in case of the BRS installed behind the occupants, regardless if inside or outside the cabin, compliance with the requirements of CS VLA.561(c) must be shown for the system.

(h) The system must be labelled to show its identification, function, and operating limitations. Markings and warning placards have to be placed near the rocket ejection opening and near the actuation handle(s), stating of the hazard associated with such devices.

(i) A warning placard (design and dimension see figure 1) must be located on a fixed part of the fuselage near the rocket motor but not on the cover for the rocket ejection opening. Sufficient warning placards must be provided such that one is always in view regardless of the orientation of the aircraft.

(k) The EASA-approved flight manual must include a thorough explanation of operation and limitations as well as the safe deployment envelope.

(l) It must be shown that the occupants will be protected from serious injury after touchdown under high wind conditions (15kts).

5. System Protection

(a) All components of the system must provide protection against deterioration due to weathering, corrosion, and abrasion.

(b) Adequate provisions must be made for ventilation and drainage of the parachute canister and associated structure to ensure the sound condition of the system.

6. System Inspection Provisions

(a) Instructions for continued airworthiness must be prepared for the system that meets the requirements of CS VLA.1529, including inspection, repacking, and replacing the parachute and deployment mechanism.

(b) Adequate means must be provided to permit the close examination of the parachute and other system components to ensure proper functioning, alignment, lubrication, and adjustment during the required inspection of the system.

7. Operating Limitations

The Airplane Flight Manual (AFM) must include

(a) The deployment envelope of the BRS,

(b) Any other operating limitation necessary to ensure proper operation of the system within its deployment envelope, and

(c) A detailed description of the system, including operation and procedures.

8. Continued Airworthiness Limitation

The limitation section of the Instructions for Continued Airworthiness must include all BRS related life limits, required by the BRS manufacturer. Specific limitations which are caused by the installation have to be considered.

Figure 1: Warning placard (minimum height: 12.7 cm (5 inch))