

# **Proposed Special Condition SC-VLA.901-02 for CS-VLA Aeroplanes with embedded aft engines and aft propeller**

## **Introductory Note:**

The hereby presented 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 12/2007 dated 11 September 2007, Article 3 (2.), 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**

The Certification specifications CS-VLA are applicable for single engine aeroplanes. Conventionally single engine aeroplanes are in tractor configuration, with the propeller and the engine in the front. The case of an embedded engine in the aft fuselage and the propeller also installed in the aft fuselage is not fully addressed by the CS-VLA requirements.

## **Justification**

The configuration where an embedded engine is installed in the aft fuselage and the propeller is also installed in the aft fuselage poses additional hazards that need to be addressed via specific requirements. Considering the above, the following Special condition is proposed:

### **SPECIAL CONDITION SC-VLA.901-02**

## **CS-VLA Aeroplanes with embedded aft engines and aft propeller**

### **Fire protection**

#### **SC-VLA.901-02-1181**

- a) The designated fire zone in the engine compartment shall be identified.
- b) It must be demonstrated that an engine fire will be contained within the designated fire zone after recognition of a fire occurrence and flammable fluids are turned off.

#### **SC-VLA.901-02-1182 – areas adjacent to the designated fire zone**

CS-VLA 1182 apply to components, lines, and fittings installed in the areas adjacent to the fire zone (as defined according to SC-VLA.901-02-1181 a)).

#### **SC-VLA.901-02-1351 – fire protection of electrical equipment**

CS-VLA 1351 e) apply to Electrical equipment installed in the areas adjacent to the fire zone (as defined according to SC-VLA.901-02-1181 a)).

### **SC-VLA.901-02-1203 - Fire detection**

- a) There must be means that ensures the proper detection of a fire in the engine compartment.
- b) Each fire detector system must be constructed and installed to withstand the vibration, inertia and other loads to which it may be subjected in operation.
- c) No fire detector may be affected by any oil, water, other fluids, or fumes that might be present.
- d) There must be means to allow the crew to check, in flight, the functioning of each fire detector electric circuit.
- e) Wiring and other components of each fire detector system in a designated fire zone must be at least fire-resistant.

### **Loads**

#### **SC-VLA.901-02-371 – gyroscopic loads**

In addition to the inertial and aerodynamic loads acting on the airframe, the aeroplane shall be designed for the gyroscopic loads resulting, with the propeller at maximum continuous rpm, under the conditions prescribed in CS VLA-351 and CS VLA-423. The gyroscopic loads should be combined with the inertial and aerodynamic loads in rational manner.

#### **AMC SC-VLA.901-02-371**

In absence of data, the following angular speeds can be considered

- i. A yaw velocity of 2.5 radians per second;
- ii. A pitch velocity of 1.0 radian per second;

#### **SC-VLA.901-02-925 ground clearance**

In addition to CS-VLA 925, the aeroplane shall be designed such that the propeller will not contact the runway surface when the aeroplane is in the maximum pitch attitude attainable during normal take-off and landings.