COMMENT RESPONSE DOCUMENT

EASA SC-VLA.901-02 is.1 for CS-VLA Aeroplanes with embedded aft engines and aft propeller
[Published on the 18-07-2016 and officially closed for comments on the 12-08-2016]

Commenter 1 : CAA NL (Mr.Eelco Bakker) – date 20-07-2016

Comment # 1

Paragraph No: SC-VLA.901-02-1203 - Fire detection

Comment: Add further requirement, subpart f)

Justification: --

Proposed Text (if applicable): ADD f) Information conform CS-VLA 1529 shall be prepared regarding the proper functioning of the fire detection system including the wiring and the electric circuit.

EASA response: not Accepted

CS VLA.1529 is part of the certification basis and every system shall meet it. The addition of this requirement is redundant.

Commenter 2 : LBA (Mr. Helmut Fendt) – date 09-08-2016

Comment # 2

Paragraph No: SC-VLA.901-02-1203 – Fire detection

Comment: Add text

Justification: - (Independence of electrical systems)

Proposed Text (if applicable): ADD f) The fire detection system must be independent from the electrical aircraft system.

EASA response: not accepted

The only scenario where the fire detector would not work in event of a fire, would be a double failure scenario: failure of the electrical system during flight and fire of the engine. The only single failure scenario is a fire of the engine that would result in a failure of the detector electrical system, but in this case the latter failure would happen after detection of the fire. This is in line with the CS VLA.1309.

Commenter 3 : FAA (Mr. Doug Rudolph) – date 09-08-2016

Comment # 3

Paragraph No: SC-VLA.901-02

Comment: Special condition SC-VLA.901-02 focuses more upon systems issues with fire containment. From the structures group, we think a bigger issue is the Firewall capability of the airplane. Fire containment should also consider structural aspects; especially due to the composite construction. It is likely that fire containment heat will affect structural integrity. *The certification basis should take this into account.*

Justification: Due to the embedded nature of this engine, we should require an equivalent firewall test that confirms that the aircraft can contain an engine compartment fire without damaging the structure.

Proposed Text (if applicable): -

EASA response: not accepted

The aim of this special condition is to address only aspects which are specific to the configuration of the aft embedded engine and propeller. The fire protection of the composite structure is already addressed by existing CS VLA requirements (e.g. CS VLA.865). Furthermore an AMC CRI (CRI E-101) is used for such projects that provide Acceptable means of compliance to fire protection requirements of CS-VLA and addresses also the effects of fire on composite structure.

Comment # 4

Paragraph No: SC-VLA.901-02

Comment: The FAA also has implemented pusher–type specific regulations which should be considered; refer to 14 CFR part 23 amendment 43 changes:

14 CFR part 23.905 added:

(e) All areas of the airplane forward of the pusher propeller that are likely to accumulate and shed ice into the propeller disc during any operating condition must be suitably protected to prevent ice formation, or it must be shown that any ice shed into the propeller disc will not create a hazardous condition.

(f) Each pusher propeller must be marked so that the disc is conspicuous under normal daylight ground conditions.

(g) If the engine exhaust gases are discharged into the pusher propeller disc, it must be shown by tests, or analysis supported by tests, that the propeller is capable of continuous safe operation.

(h) All engine cowling, access doors, and other removable items must be designed to ensure that they will not separate from the airplane and contact the pusher propeller.

Justification: -

Proposed Text (if applicable): -

EASA response: – partially Accepted

CS 23.905 f,g,h and related AMC will be added. CS 23.905 e) will be added only for aeroplanes that obtain concurrent approval for IFR use via EASA special condition SC-OVLA-div-03. It is found acceptable for VFR to not consider the risk of inadvertent ice encounter as per CSC 23.905 e).

Comment # 5

Paragraph No: SC-VLA.901-02

Comment: 14 CFR part 23.925 added:

(b) *Aft-mounted propellers.* In addition to the clearances specified in paragraph (a) of this section, the airplane must be designed such that the propeller will not contact the runway surface when the airplane is in the maximum pitch attitude attainable during normal takeoff and landings. If a tail wheel, bumper, or an energy absorption device is provided to show compliance with this paragraph, the following apply:

(1) Suitable design loads must be established for the tail wheel, bumper, or energy absorption device; and

(2) The supporting structure of the tail wheel, bumper, or energy absorption device must be designed to withstand the loads established in paragraph (b)(1) of this section and inspection/replacement criteria must be established for the tail wheel, bumper, or energy absorption device and provided as part of the information required by Sec. 23.1529

Justification: -

Proposed Text (if applicable): -

EASA response: Noted

Requirement SC-VLA.901-02-925 of the special condition addresses the aspects of propeller ground clearance.

Comment # 6

Paragraph No: SC-VLA.901-02

Comment: Also note that, 14 CFR at amendment 62 requires fire detection and extinguishing for embedded engines.

Justification: -

Proposed Text (if applicable): -

EASA response: Noted

Fire detector is required in SC-VLA.901-02-1203. A fire extinguishing system is not required since in CS-23 a fire extinguishing system is required only for commuter category. The effects of a fire in the engine compartment is addressed through the requirements in CS-VLA complemented by the Fire protection requirement of this special condition.

Comment # 7

Paragraph No: SC-VLA.901-01

Comment: The fire zone engine compartment issues appear to follow Part 23 requirements that could be used, but 14 CFR parts 23.905 and 23.1193 should be considered for additional or similar requirements.

Justification: -

Proposed Text (if applicable): -

EASA response: Noted and partially accepted.

Regarding requirement 14 CFR 23.905, see comment #4. Regarding requirement 14 CFR 23.1193, corresponding sub-requirement CS 23.1193 g) will be considered.

The following text will be added:

"SC-VLA.901-02-1193 – cowling and nacelle

In addition to CS VLA a,b,c,d,e, the following requirement should be added:

f) the aeroplane must be designed so that no fire originating in the engine compartment can enter, either through openings or by burn-through, any other region where it would create additional hazards"

Commenter 4 : TCCA (Mr. Ngassam) – date 23-08-2016

Comment # 8

Paragraph No: AMC SC-VLA.901-02-371

Comment: It is surmised these requirements were derived from those in CS-23.371(a)(2). Without the underlying analyses available for review, it would appear conditions iii) and iv) of the aforementioned standard (related to the normal load factor and thrust conditions) could be missing.

Justification: -

Proposed Text (if applicable): -

EASA response: Accepted

The aim of the AMC is to provide values of angular speeds that can be used for the calculation of the gyroscopic loads required in SC-VLA.901-02-371. According to this requirement, the gyroscopic loads should be added to the inertial and aerodynamic loads acting on the airframe, according to the CS VLA requirements. The value of the load factor is intentionally not provided in the AMC since the load factor should be added depending on the flight conditions "in a rational manner". The trust loads have not been specified in the SC-VLA.901-02-371 and they will be added. The following text will be modified:

Was: The gyroscopic loads should be combined with the inertial and aerodynamic loads in rational manner.

Will be: The gyroscopic loads should be combined with the inertial, aerodynamic loads and trust loads in rational manner.