

Equivalent Safety Finding on CS 25.1191 : Firewalls

Applicable to Boeing 737-7, B737-8 and 737-9

Introductory Note:

The hereby presented Equivalent Safety Finding has been classified as an important Equivalent Safety Finding 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.) 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:

CS 25.1191 requires that each engine be isolated from the rest of the airplane by fireproof firewalls to prevent the propagation of fire originating from the engine fire zones to the rest of the airplane and states :

- (a) *Each engine, fuel-burning heater, other combustion equipment intended for operation in flight, and the combustion, turbine, and tailpipe sections of turbine engines, must be isolated from the rest of the aeroplane by firewalls, shrouds, or equivalent means.*
- (b) *Each firewall and shroud must be –*
- (1) Fireproof;*
 - (2) Constructed so that no hazardous quantity of air, fluid, or flame can pass from the compartment to other parts of the aeroplane;*
 - (3) Constructed so that each opening is sealed with close fitting fireproof grommets, bushings, or firewall fittings; and*
 - (4) Protected against corrosion.*

To particularly meet the requirement 25.1191(b)(1), the following pass/fail criteria was found acceptable during EASA fire test plan review:

Firewall – pass/fail criteria:

- *Shall be capable of withstanding the loads specified throughout the test period.*
- *No significant increase of the flame pattern during the test*
- *No burning of the backside of the specimen during or following the burner removal at the end of the test.*
- *Any burning on the impingement face following burner removal shall be submitted to the checking authority for acceptance.*
- *No backside ignition of the outgassing during test. Outgassing of the back side shall be investigated to determine if a risk of ignition exists.*
- *No flame penetration.*

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Applicant Proposal:

Boeing has proposed 737-7/-8/-9 Inlet aft bulkhead firewall design that include a limited amount of firewall sealant on the non-fire or "cold" side of the firewall that has a possibility of igniting during a fire in the fan compartment fire zone.

The Boeing design does not fulfil the pass criteria allowing to declare by direct compliance demonstration that the firewall sealant are fireproof since those latest are prone to have backside ignition, therefore a set of compensating factors have been proposed by Boeing.

Applicant Safety Equivalency Demonstration:

The following compensating factors have been proposed by Boeing to provide an equivalent level of safety to CS 25.1191(b)(1) :

- The areas adjacent to the firewall containing the firewall sealant on the cool side are "dry bays" and do not have any flammable fluid carrying components, lines, or vapor.
- There are no other combustible materials adjacent to the sealant.
- The sealant on the cold side is of a limited quantity which limits the potential flame size and intensity in the unlikely event of ignition.