COMMENT RESPONSE DOCUMENT

EASA CRD of Equivalent Safety Finding on CS 25.1191(b) : Firewalls
Applicable to Airbus A350
[Published on 14 August 2017 and officially closed for comments on 04 September 2017]

Commenter 1: Boeing Commercial Airplanes – Capt. Terry L. McVenes / Director, System Safety & Regulatory Affairs – 01 Setember2017

Comment # 1 : General

The current fire resistant standard does not meet the prescriptive standard of a fire proof fire wall as required by CS 25.1191(b) and CS-Definitions for fire proof. Justifying why a fire resistant standard does not produce a hazard to the aircraft does not demonstrate that a fire resistant firewall is equivalently safe to a fire proof firewall. The regulatory requirements do not require that no hazard be shown. In order to show equivalent safety, compensating features must exist which provide a level of safety equal to a compliant (fire proof) installation. No compensating features are provided, only a hazard assessment, which does not show equivalent safety.

The configuration does not meet the fire proof standard prescriptively required by the wording of the regulation or its intent (to be able to withstand a 1100C flame for 15 minutes not the 5 minute standard offered in the ESF). The definitions of fire proof and fire resistant are different between the two regulators. Therefore it is Boeing's understanding that CS 25.1191(b), which uses fire proof, should be considered a Significant Standards Difference which would require a review by the FAA under the bi-lateral agreement as the validating authority. As such, the request for an ESF should be withdrawn and the applicant may opt to apply for a deviation to the EASA regulation and an exemption from the FAA regulation.

In summary, CS 25.1191(b) prescriptively requires a fire proof standard. The fire resistant standard offered in the ESF is not equivalent to a fire proof standard using the fire proof and fire resistant fire withstanding performance requirements stated in CS-Definitions.

Comment :

We respectfully but emphatically request EASA collaborate with the FAA and develop a harmonized methodology before the ESF is granted. Currently, the FAA does not allow United States (US) applicants do what this proposal would allow.

EASA response: *(Please indicate if EASA agrees, partially agrees, or disagrees)*

EASA partially agrees with Boeing, however, continues the process to grant equivalent safety as discussed per EASA CRI E-1022.
EASA's position has been discussed and synchronised with the FAA due to harmonized requirements. The FAA is processing the same ELOS request through FAA IP-1038. We anticipate the FAA will make the same equivalent safety finding.
EASA agrees with Boeing that engine fire walls surrounding a designated fire zone should be fire proof in flight and fire proof on ground (15 minutes fire withstanding capability as per ISO 2685 or FAA AC 20-135). EASA continues to respect these CS 25.1181 and 25.1191 requirements.
However, EASA has found that in the engine certification process on a variety of engines recently certified or still in the certification process under CS-E or Part 33, it was assumed that demonstrating that the engine fire walls were fire proof in flight would be the most demanding and conservative test condition. The full on-ground fire withstanding capability was therefore found undemonstrated, but could be expected to be significantly greater than 5 minutes.
For powerplant integration compliance demonstrations, however, in absence of test data or a convincing analysis, a minimum of 5 minutes fire withstanding capability (= fire resistant) on ground needed to be assumed.
The CS-E interpretation apparently has existed unknowingly for many past years, until propulsion system integration became aware of it in discussions with the aircraft TC Holder. When becoming aware of interpretation differences at aircraft and engine level certification and when the issue could not directly be solved, the designs under certification and validation have been reviewed, and it has been decided on European side that the engine installation manual would need to contain a statement, clarifying any issue with the firewall fire proofness ON GROUND. The installer then would need to take appropriate action integrating the engine on his aircraft. Further communication was started up between EASA, the FAA and the industry in a working group on engine / aircraft integration issues.
CS 25.1191 leaves some room for interpretation, in allowing to interpret that the engine must be isolated from the aircraft by firewalls, shrouds or equivalent means, and discusses no migration of hazardous quantities air fluid or flame to be a hazard for the airplane. The 'fire wall' in terms of CS 25.1191 could be interpreted to be constituted of several layers of protection (external to the core zone, the bypass duct inner wall, the cowlings and the 2D zone exist).
EASA has interpreted in this specific case (only for the on ground situation) that – given the situation that some individual seals in the core zone fire proof fire wall are only fire resistant - there is sufficient isolation between the engine and aircraft, so that there would not be a hazard to evacuate the passengers or a hazard to the aircraft in case these core zone seals would fail after 5 minutes in a core zone 2 fire on ground. The rather complex compliance demonstration involves on top of fire aspects also fire detection and extinguishing elements, draining and all possible scenarios w.r.t. a possible migration of flammable fluids after 5 minutes out of the core zone on ground.

The A350-1000 design therefore can be seen as equivalently safe, based on compensating elements and the design provides the same level of safety compared to the last generations of modern transport aircraft (that may have overlooked the issue).

No changes have been made to the Equivalent Safety Finding with CS 25.1191 (b) at amendment 13 as discussed in CRI E-1022 in response to this comment.

Note 1: ***If more than 6 comments are received, copy the (empty!) tables for #5 and #6 and paste these below, re-numbering these as #7 and #8, and so on, ad infinitum.***

Note 2: ***When writing an EASA response, the responder should express first whether EASA agrees, partially agrees, or disagrees with the submitted comment /change proposal and should explain the grounds of the response.*** ***[****e.g. "we disagree. Vibration trend monitoring is successful in detecting cracked HPT seals, /… / and is the most practical way to prevent an unsafe condition due to cracked HPT seals", or "we agree. We have amended the Final AD accordingly"****]. Unless EASA (partially) agrees with a comment, a statement should be added (for each comment) that 'No changes have been made to the Final AD in response to this comment'.***