

MAR 26 1990

ACTION: Equivalent Level of Safety:  
Optica OA-7, Firewall Finding No. ACE-90-3

Manager, Brussels Aircraft Certification Staff,  
AEU-100

Manager, Small Airplane Directorate,  
Aircraft Certification Service, ACE-100

Background: Brooklands Aerospace Group (BAG) Manufacturer of the OA-7 airplane, propose to not provide a firewall to isolate the engine from the remainder of the airplane as required by Section 23.1191(a) and (b) of the Federal Aviation Regulation (FAR).

Applicable Regulation Section 23.1191, Firewalls:

"(a) Each engine, auxiliary power unit, fuel burning heater, and other combustion equipment intended for operation in flight, must be isolated from the rest of the airplane by firewalls, shrouds, or equivalent means.

(b) Each firewall or shroud must be constructed so that no hazardous quantity of liquid, gas, or flame can pass from the engine compartment to other parts of the airplane."

Applicant's Position: Optica Structural Adequacy-Engine Fire Report No. EA7/STRUCT/087, Issue No. 3 contains the applicant's position. They indicated the engine is isolated from the fuselage by being suspended on fireproof engine mounts aft of the fuselage. Any fire originating in the engine compartment cannot enter the cabin. Therefore, the normal airflows thru and over the engine and fuselage will provide acceptable isolation between the engine and the rest of the airplane.

FAA Position: Section 23.1191(a) of the FAR requires that each engine be isolated from the rest of airplanes by (fireproof) firewalls, shrouds, or equivalent means. This will assure that during a powerplant fire, flame will not enter the personnel compartment. A conventional airplane with the engine in the front would require such a firewall.

ACE-110 letter dated July 27, 1988 (attached), indicates that airspace is not an acceptable method of showing compliance with Section 23.1191(a) and (b) of the FAR in lieu of a fireproof firewall. We concur with this position for conventional airplanes where the airflow from the engine compartment comes in contact with the fuselage.

The unique features of the Optica OA-7 airplane provide natural protection by having a rear-mounted engine that is isolated from the airplane. Optica Report No. EA7/STRUCT/087 provides information that the integrity of the engine mount will be preserved during a powerplant fire. Also, the engine is isolated from the rest of the airplane and there is no path for flame, heat or smoke to enter the pilot's compartment.

The airplane does not have any section of the airplane that could duct or transmit flames or hot gases into the cabin area. Further, the engine mount is attached to the fuselage with solid fittings that would not provide a path for flame or hot gases to contact the cabin.

Compensating Features: In the event of a powerplant fire, flame, or heat will not contact the personnel compartment due to the unique design features of the Optica airplane. The engine is isolated from the cabin and fuselage by considerable distance. The air stream passing over the engine is already past the cabin/fuselage and thus direct flames/fumes/smoke away from the cabin.

Recommendation: We concur that the Optica airplane is acceptable without a fireproof firewall and provides an equivalent level of safety to Section 23.1191(a) and (b) of the FAR.

Everett Pittman

Attachments

Concurred by:

  
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Manager, Standards Office, ACE-110

Original Signed By  
Gerald W. Pierce

  
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Barry D. Clements  
Manager, Small Airplane Directorate,  
Aircraft Certification Service, ACE-100

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Date

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Date

cc:  
ACE-110



U.S. Department  
of Transportation

**Federal Aviation  
Administration**

4077  
JD  
**Memorandum** 448  
I.L.

**Subject:** INFORMATION: Brooklands Aerospace Group (BAG) OA-7 Date: JUL 3, 1988  
"Optica" Type Certification Board Meeting Minutes  
and Issue Papers; ACE-105 Memo of 7/7/78

**From:** Manager, Standards Office, ACE-110

Reply to  
Attn. of:

**To:** Manager, Project Support Office, ACE-105

We have reviewed the referenced memo and attached issue papers. We offer the following comments on Issue Papers C-5, P-2, and P-3:

Definition of Aerodynamic Loads, Issue Paper C-5.

Compliance for the ducted propeller configuration of the Model OA-7 airplane may be shown by either flight tests, by analysis supported by flight test data, or by analysis supported by wind tunnel test data from a scaled model of a size adequate to have confidence in the data.

Propeller Clearance and Containment, Issue Paper P-2

While § 23.925(c) requires at least 1 inch clearance between the propeller blade tip and airplane structure, § 23.925 allows for substantiation of smaller clearances. This substantiation should show that there is no unsafe condition caused by any combination of atmospheric, and take off/flight/landing conditions.

Vibration investigation of the propeller and structure, including vibration induced into the structure by the passing of the propeller blades, should also be accomplished. The vibration should be analyzed to determine if fatigue may result.

The substantiation should consist of both analysis and flight testing.

Firewalls, Issue Paper P-3

Airspace is not acceptable as a firewall or shroud. The applicant should comply with § 23.1191.

Earsa L. Tankesley