



U.S. Department
of Transportation
**Federal Aviation
Administration**

Memorandum

Subject: **ACTION**: Request for Review and Concurrence with
Associated Equivalent Level of Safety (ELOS) ACE-00- 07
for the Extra EA-400 Airplane, 14 CFR § 23.807(b)(2)

Date: JUN 27 2000

From: Extra Project Officer, Project Support Branch, ACE-112

Reply to Karl Schletzbaum
Attn. of: (816) 329-4146

To: Manager, Small Airplane Directorate, ACE-100

This memorandum documents concurrence for the subject ELOS, we request your office review and concur with the proposed ELOS findings to the Emergency Exits requirements of 14 CFR § 23.807(b)(2).

Background: The Extra EA-400 airplane is a T-Tail, high wing airplane fabricated almost completely of composite materials. The main entry door is divided into an upper and lower section. The airplane is configured so that when the left-hand flap is deployed the upper door can only be extended enough to clear the edge of the lower door with an additional small clearance. To obtain additional clearance, the door can be pushed against the flap, which has a breakable edge. This allows extra clearance, if required, to easily reach and deploy the lower door opening mechanism. The lower door can then be deployed and used to egress the airplane in this configuration.

Applicable Regulations: The applicable regulations are 14 CFR Part § 23.807(b)(2), which states:

§ 23.807(b) *Type and operation*.... In addition, each emergency exit must--

(2) Have a method of opening that is simple and obvious....

Applicant's Position: Extra Flugzeugbau (Extra) certificated the EA-400 airplane with this same design in 1998. However, the Federal Aviation Administration (FAA) raised concerns about the egress features as described above when the airplane was upgraded to a six-seat configuration in Germany and validation of this configuration was requested in the United States.

Due to these concerns, the Luftfahrt-Bundesamt (LBA) and Extra agreed to perform additional tests and to add placards that emphasized the egress of the door with the flap in the deployed position, even though the configuration had been approved in Germany.

Extra submitted the results of opening tests in test report EA-05306.09-1, *Ground Test Emergency Exit*. These tests included naive subjects that opened the airplane based on the added placards. The functionality of the door and the times obtained for the subjects to open the doors were witnessed by the LBA and considered satisfactory. Additionally, geometric studies and tests were done to assure that a 19" x 26" ellipse opening was available with the airplane in a position of a collapsed left main landing gear, the most conservative geometric position for egress.

Additionally, on March 14, 2000, an FAA test pilot specifically evaluated the opening and determined that the egress from the interior of the airplane was acceptable with the flaps in the extended position.

FAA Position:

The LBA has approved the initial design and witnessed and reviewed the additional tests requested by the FAA. The FAA believes that with the addition of the placards clarifying the egress procedure, the additional test and evaluation substantiates compensating features and function of the design that provide an adequate level of safety.

Compensating Features: The applicant has incorporated features that clarify the opening of the main door from the outside in the event of an emergency. These features included the addition of pictograms on the outside of the airplane, and a breakable flap corner that allows additional space to access the lower door opening mechanism to open the lower door. These features were substantiated by tests and shown to be performable in a reasonable amount of time. The placards will be required as part of the type design and listed in the Airplane Flight Manual as required.

Additional specific evaluations substantiated that the airplane, even with a left gear collapsed, has the minimum 19" x 26" ellipse egress areas as required for emergency exits.

The design was also specifically evaluated by an FAA test pilot on March 14, 2000, with the airplane sitting on its gear in a normal attitude.

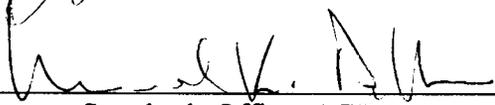
Recommendation: We concur that the Extra EA-400 design of the emergency egress provisions of the EA-400 airplane provide an Equivalent Level of Safety (ELOS) as envisioned in the regulation of paragraph 14 CFR § 23.807(b)(2).

Concurred by:



 Manager, Project Support Branch, ACE-112

6/26/00
 Date



 Manager, Standards Office, ACE-110

6-26-00
 Date

acting 

 Manager, Small Airplane Directorate, ACE-100

6-27-00
 Date