



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

Memorandum

Subject: **ACTION:** Project No. TC1616SE-A—Pacific Aviation Composites (PACUSA) Lancair LC40-550FG— Requesting Review of and Concurrence with Equivalent Level of Safety (ELOS), 14 CFR Part 23, §§ 23.201, 23.203, and 23.221, Stalls and Spins. (This ELOS is an addendum to ELOS No. ACE-98-1); **ACE-98-2**

Date: **OCT 7 1998**

From: Manager, Seattle Aircraft Certification Office,
ANM-100S

Ref.
No.: 98-190S-608

To: Manager, Small Airplane Directorate, ACE-100
ATTN.: S. M. Nagarajan

Reply to J. Morfitt
Attn. of: (425) 227-2595

Background:

The requirements of Equivalent Level of Safety Finding (ELOS) No. ACE-98-1 have been met by the LC40-550FG except as follows: Performing the 30 degree left and right rolls required by Part 23, § 23.221(a)(2)(i) when tested at 75 percent power, aft center of gravity (cg), light weight, and full flaps, was possible, but only by using a high level of pilot skill.

Applicable Regulations:

§§ 23.201, 23.203, and 23.221, Stalls and Spins.

Applicant Position:

PACUSA would like to submit the following Equivalent Level of Safety proposal.

The LC40-550FG airplane has been found to comply with §§ 23.201 and 23.203 at all required power, cg location, and flap combinations via ELOS No. ACE-98-1. It has also been found to comply with § 23.221 at all required power, cg location, and flap combinations via ELOS No. ACE-98-1 with the following exception: The 30 degree left and right bank maneuver required by § 23.221(a)(2)(i) required a higher level of pilot skill than was defined as acceptable by ELOS No. ACE-98-1, when performed at 75 percent power, aft cg, and full flaps. The maneuver could only be performed successfully in this configuration if rudder/aileron coordination was maintained perfectly.

During FAA flight tests, the airplane has been shown to be truly spin resistant for forward cg locations with any flap/power combination. It has also been shown to be truly spin resistant at any cg/flap combination with idle power. The airplane recovers immediately and accelerates quickly when full aft stick is relaxed, and demonstrates exceptional stall warning characteristics in the form of a pronounced pitch bucking. Another factor is that the pitch attitude is between 20 and 30 degrees nose up with full aft stick in the 75 percent power/aft cg/full flap configuration. While this is below the 30 degrees pitch up which would be needed before a lower power setting could be used, it is still steep enough to get the pilot's attention. The airplane's relatively high climb performance increases the safety margin during a go around, which is the situation where high power and full flaps are most likely seen in combination in service.

Compliance has been demonstrated for the majority of § 23.221(a)(2), and the LC40-550FG has exhibited an exceptional level of safety in the stall/post stall regime. PACUSA feels that the combination of characteristics demonstrated by the LC40-550FG provides a level of safety equivalent to that required by the regulations.

FAA Position:

The proposal detailed above in the applicant position section of this memo provides a level of safety that is equivalent to or better than that provided by compliance with the one turn spin recovery option allowed under § 23.221(a)(1). Therefore, the FAA agrees that this equivalent level of safety criteria may be used as an addendum to ELOS No. ACE-98-1 for showing compliance.

Compensating Features:

- a. Spin resistant at forward cg in combination with power settings up to 75 percent and any flap setting.
- b. Spin resistant at aft cg and any flap setting in combination with idle power.
- c. Exceptional stall warning characteristics.
- d. Immediate recovery to normal flight and quick acceleration when full aft stick is relaxed.
- e. Relatively high climb performance of the aircraft increases the safety margin in a go around situation.
- f. Pitch attitude which is sufficient to get the pilot's attention at the power/flap/cg combination in question.

Recommendation:

We concur that the PACUSA proposal detailed above in the applicant position section of this memo in combination with ELOS ACE-98-1 provides an equivalent level of safety as envisioned by the regulations and, thus, meets the requirements of §§ 23.201, 23.203, and 23.221.

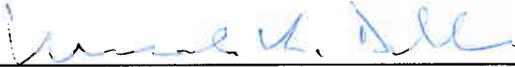


for _____
Manager, Seattle Aircraft Certification Office, ANM-100S

9/22/98

Date

Concurred by:



Manager, Standards Office, ACE-110

10/16/98

Date



ACTING _____
Manager, Small Airplane Directorate,
Aircraft Certification Services, ACE-100

10/7/98

Date