



# Federal Aviation Administration

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## Memorandum

Date: September 16, 2010

To: Manager, Small Airplane Directorate, ACE-100

From: Manager, Project Support Branch, ACE-112

Prepared by: Albert J. Mercado, Project Officer, ACE-112

Subject: Equivalent Level of Safety (ELOS) Finding for Doors – proximity of propeller and main door for Costruzioni Aeronautiche Tecnam s.r.l. P2006T, FAA Project Number CE0108AM

ELOS Memo#: ACE-10-16

Regulatory ref: 14 CFR, part 23, § 23.783(b)

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This memorandum requests your office to review and provide concurrence with the proposed equivalent level of safety (ELOS) finding for the Costruzioni Aeronautiche Tecnam s.r.l. P2006T Doors – proximity of propeller and main door.

### **BACKGROUND**

The P2006T is a normal category, high wing, twin engine monoplane with four seat capacity (including 1 pilot). The airplane has a forward left main door, an aft right emergency door, and a ditching emergency exit on top the side.

During the European Aviation Safety Agency (EASA) certification it was noted that the main door was situated near the left propeller disc and the applicant was requested to provide compliance with Certification Specifications 23.783(b). The EASA granted an Equivalent Safety Finding to Certification Specifications 23.783(b) during its certification. This is documented in the EASA Type Certificate Data Sheet (TCDS) and CRI D-02.

The applicant proposes a similar ELOS to 14 CFR, part 23, § 23.783(b) for the Federal Aviation Administration validation.

The applicable regulation is 14 CFR, part 23, § 23.783(b) which states:

- (b) Passenger doors must not be located with respect to any propeller disk or any other potential hazard so as to endanger persons using the door.

### **APPLICABLE REGULATION(S)**

The certification basis for the Costruzioni Aeronautiche Tecnam s.r.l. P2006T is 14 CFR part 23 Normal Category, as amended through Amendment 23-57. Additional Special Conditions, ELOS, and Exemptions may be incorporated during this project.

### **REGULATION(S) REQUIRING AN ELOS FINDING**

14 CFR, part 23, § 23.783(b)

#### **Description of compensating design features or Alternative Methods of Compliance (AMOC) which allow the granting of the ELOS (include design changes, limitations or equipment need for equivalency)**

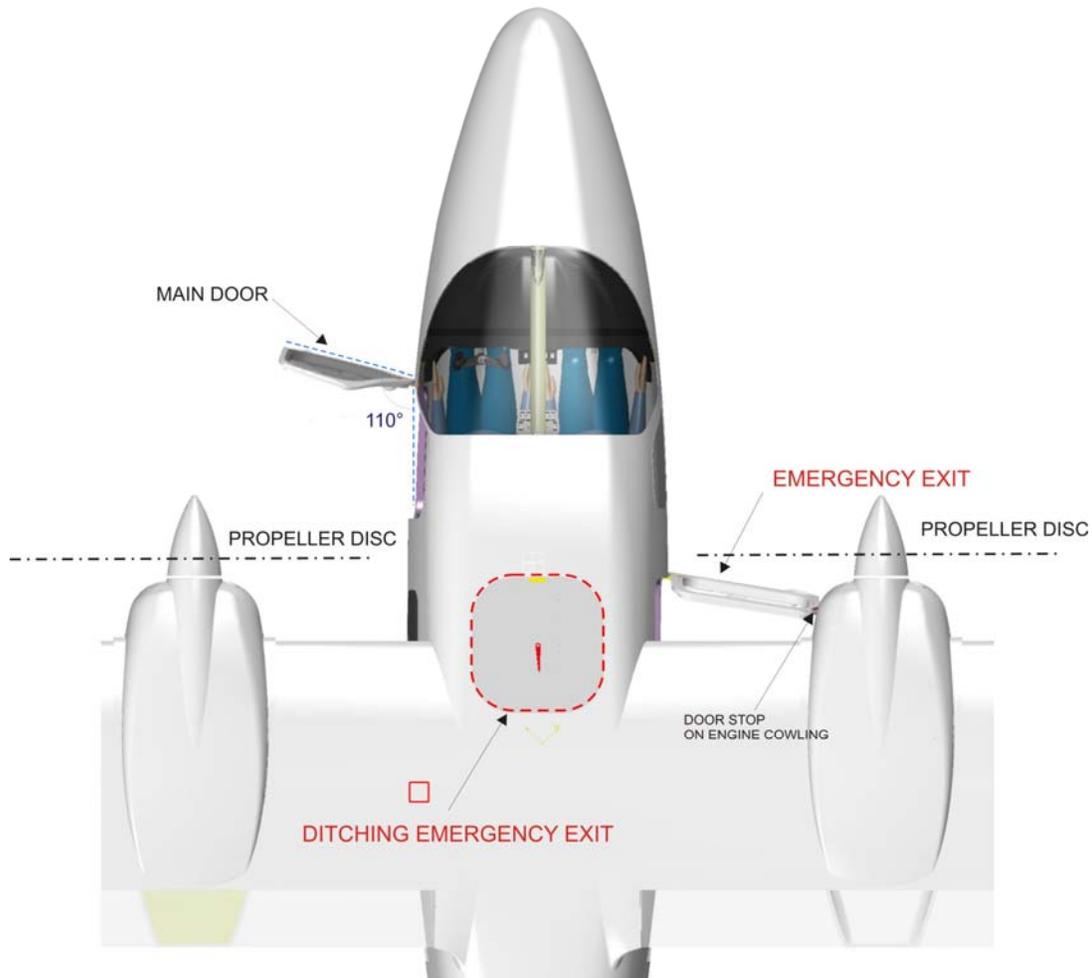
The aircraft P2006T is a twin engine (normal category) high wing configuration with a four seat arrangement. The airplane is equipped with a forward left main door, an aft right emergency door and a ditching emergency exit on top side. The small dimensions of the fuselage (designed to accommodate only 4 people), the requirement to have a door on each side (emergency exits requirement), and the need to have an easy access to the front seats resulted in the main door being situated near the left propeller disk.

The compensating features and alternate methods of compliance proposed by Costruzioni Aeronautiche Tecnam s.r.l. are provided below.

- The door opening system provides a means to lock and safeguard the door from being inadvertently operated when the engine is running. This device consists of a solenoid door lock which is actuated by an engine oil electric pressure switch and keeps the door closed and locked when the engine is running.
- An indicating system provides a warning light to indicate that the door is open, or closed but not locked. The position and installation method of the manual by-pass solenoid unlock avoid inadvertent operation. Any voluntary operation of the manual by-pass solenoid lock causes door warning light on.
- The electric lock becomes disengaged after a complete loss of the electric power.
- The engines are reciprocating type and are equipped with gear boxes that assure the immediate stop of the propellers once the engines are turned off.
- The door is designed and placarded so it can be opened from inside and outside by passengers and by ground personnel.

- The door is located on the pilot side. The pilot is the last to enter in the aircraft before engine starting.
- The door itself, considering its opening angle with respect to the propeller plane ( $110^\circ$  with respect to longitudinal axis), provides to guide the passengers away from the propeller.

The sketch below shows the door when in its opening configuration.



- A procedure provided in the flight manual and a placard located on the inside of the door states that the pilot has to stop the engines and turn off the master switches and then operates locks and gets out the aircraft.
- Passengers, following the instruction placarded inside the door and guided by the pilot, must exit while keeping themselves near the opened door. The  $110^\circ$  opening with respect to longitudinal axis is also considered enough to guide occupants away from propeller disc considering that under no circumstances the engine have the starters engaged when the door is open.

These design features and alternative means of compliance meet the guidelines illustrated in the AC 23.17b for an ELOS finding process about the § 23.783(b).

**FAA APPROVAL AND DOCUMENTATION OF THE ELOS FINDING:**

The ELOS requested by Costruzioni Aeronautiche Tecnam s.r.l. and concurred with the EASA/ENAC for subject requirements is acceptable to the FAA.

The FAA has approved the aforementioned equivalent level of safety finding in project issue paper S-2. This memorandum provides standardized documentation of the ELOS finding that is non-proprietary and can be made available to the public. The Small Airplane Directorate has assigned a unique ELOS Memorandum number (see front page) to facilitate archiving and retrieval of this ELOS. This ELOS Memorandum number should be listed in the Type Certificate Data Sheet under the Certification Basis.

Equivalent Level of Safety Findings has been made for the following regulation(s):  
14 CFR, part 23, § 23.783(b).

*William J. Timberlake*

*9-16-10*

Acting Manager, Small Airplane Directorate  
Aircraft Certification Service

Date

ELOS Originated by Small Airplane Directorate:	Acting Manager, Project Support Branch, Mike Kiesov	Routing Symbol: ACE-112
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