



U.S. Department
of Transportation

**Federal Aviation
Administration**

Memorandum

Subject: **ACTION:** Equivalent Level of Safety, SIAI
Marchetti S211A, 14 CFR Part 23, § 23.562;
Emergency Landing Dynamic Conditions; Finding
No. ACE-95-4

Date:

APR 06 1995

From: Manager, Standards Office, ACE-110

Reply to
Attn. of:

To: Manager, Small Airplane Directorate, ACE-100

This memorandum is to document concurrence with an equivalent level of safety to the emergency landing dynamic conditions requirements of 14 CFR Part 23, § 23.562.

BACKGROUND:

The SIAI Marchetti Model S211A is a two-place (tandem), all metal, mid-wing cantilevered, retractable gear, pressurized, single turbofan engine airplane with a maximum weight of 6,394 pounds intended for specialized military (public aircraft) operations as a Part 23 airplane in the Acrobatic Category. SIAI Marchetti, with the S211A, is competing for the Joint Primary Aircraft Training System (JPATS) contract. The S211A is equipped with existing Martin Baker MK-10 ejection seats. This seat is used in more than 10 types of existing military jets throughout the world.

APPLICABLE REGULATIONS:

Section 23.562 contains extensive requirements for emergency landing dynamic conditions that are intended to protect each occupant during an emergency landing.

DISCUSSION:

The SIAI Marchetti S211A is an acrobatic category single turbofan engine airplane and requires ejection seats to be fitted as the only means of compliance with the requirement for bailout at speeds up to V_D as specified in § 23.807(b)(5). Marchetti selected an ejection seat with zero-zero capability to meet this objective.

Rationale in support of such an equivalent safety finding are provided below.

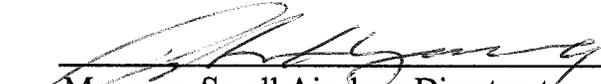
- In the military training role, pilots will be expected to abandon the aircraft (via ejection seats) rather than be exposed to the emergency landing inertia forces of § 23.562.
- After abandoning the aircraft, pilots are immune from § 23.562, i.e., they are no longer subject to injury from those forces.
- Availability of zero-zero capability in the ejection seat means that escape is possible at all altitudes from the ground up and at any speed from standstill to maximum dive speed. In our view, this capability will envelop the conditions contemplated in § 23.562.
- In the unlikely event of emergency conditions where the pilots may elect not to eject, significant occupant protection is still provided. Such incidents occurring within the envelope of § 23.562 velocity changes would include undershoots, overshoots, and wheels-up landings for which the inertia forces are primarily longitudinal. For such cases, we are advised that ejection seat restraint systems have sufficient dynamic capability to exceed the forward load case of § 23.562.

FAA'S POSITION:

The FAA finds that the installation of the ejection seats provides an equivalent level of safety to the Emergency Landing Dynamic Conditions requirements of § 23.562.

The certification basis for the Model S211A will include an equivalent level of safety finding for § 23.562.

CONCURRED BY:

 <hr/> Manager, Standards Office, ACE-110	4/6/95 <hr/> Date
 <hr/> Manager, Small Airplane Directorate Aircraft Certification Service, ACE-100	4/6/95 <hr/> Date