



U.S. Department  
of Transportation

**Federal Aviation  
Administration**

# Memorandum

Subject: **ACTION:** Equivalent Level of Safety, SIAI  
Marchetti S211A, 14 CFR Part 23, § 23.971,  
paragraphs (a) and (b); Fuel Tank Sump; Finding  
No. ACE-95-8

Date:

APR 06 1995

From: Manager, Standards Office, ACE-110

Reply to  
Attn. of:

To: Manager, Small Airplane Directorate, ACE-100

This memo documents concurrence with an equivalent level of safety to the requirements of 14 CFR Part 23, § 23.971, paragraphs (a) and (b).

## **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 Martin Baker MK-10 ejection seats.

## **APPLICABLE REGULATIONS:**

Section 23.971, paragraphs (a) and (b), contains requirements for the fuel tank sump. Paragraph (a) states that each fuel tank must have a drainable sump with an effective capacity, in the normal ground and flight attitudes, of 0.25 percent of the tank capacity, or 1/16 gallon, whichever is greater. Paragraph (b) states that each fuel tank must allow drainage of any hazardous quantity of water from any part of the tank to its sump with the airplane in the normal ground attitude.

## **DISCUSSION:**

The S211A does not have a portion of the fuel tank that can be defined, in the classical sense, as a fuel sump. However, an adequate sump volume of fuel that cannot be pumped is provided for both the wing and the fuselage cells.

For the purpose of compliance with these paragraphs, each cell has to be considered separately because any water in the fuel of the wing cell will drain from the wing cell drains, while water in the fuel of the fuselage cell will drain to the bottom of the fuselage cell. This is due to the configuration of the wing and fuselage cells. The wing cell is an integral cell and has a slight inclination toward two drain valves installed at each end of the cell to drain collected water. The wing cell does not supply fuel directly to the engine.

The fuselage cell has a capacity of 136 liters; therefore, the cell sump must have an effective capacity of  $0.0025 \times 136 = 0.34$  liters. Due to the shape of the feeding block plate (bottom of the fuselage cell), an indirect equivalent value of the cell sump capacity is the difference between the minimum quantity of fuel that the auxiliary pump cannot pump and the undrainable quantity of fuel (the plate is provided with a drain valve). This resultant value complies with the requirements (0.34 liters) for ground and flight attitudes.

**FAA'S POSITION:**

The FAA agrees with SIAI Marchetti's discussion that the design provides an equivalent level of safety to § 23.971, paragraphs (a) and (b).

The certification basis for the Model S211A will include this equivalent level of safety finding.

**CONCURRED BY:**



4/6/95

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Manager, Standards Office, ACE-110

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Date

  
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Manager, Small Airplane Directorate

4/6/95

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Aircraft Certification Service, ACE-100

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Date

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