



Federal Aviation Administration

Memorandum

Date: March 8, 2006

From: Manager, Airplane Certification Office, ASW-150

To: Manager, Small Airplane Directorate, ACE-100

Prepared by: Werner G. Koch, Mechanical Systems, ASW-150

Subject: ACTION: Review and Concurrence, Equivalent Level of Safety (ELOS) to 14 Code of Federal Regulations (CFR) § 23.783(f)(1): Finding Number: ACE-05-26

This memorandum requests that your office review and provide concurrence with the proposed finding of equivalent level of safety in accordance with § 21.21(b)(1), to the requirements of § 23.783(f)(1) for the Main Cabin Door Opening in the Sino Swearingen Aircraft Company (SSAC) Commuter Category airplane Model SJ30-2.

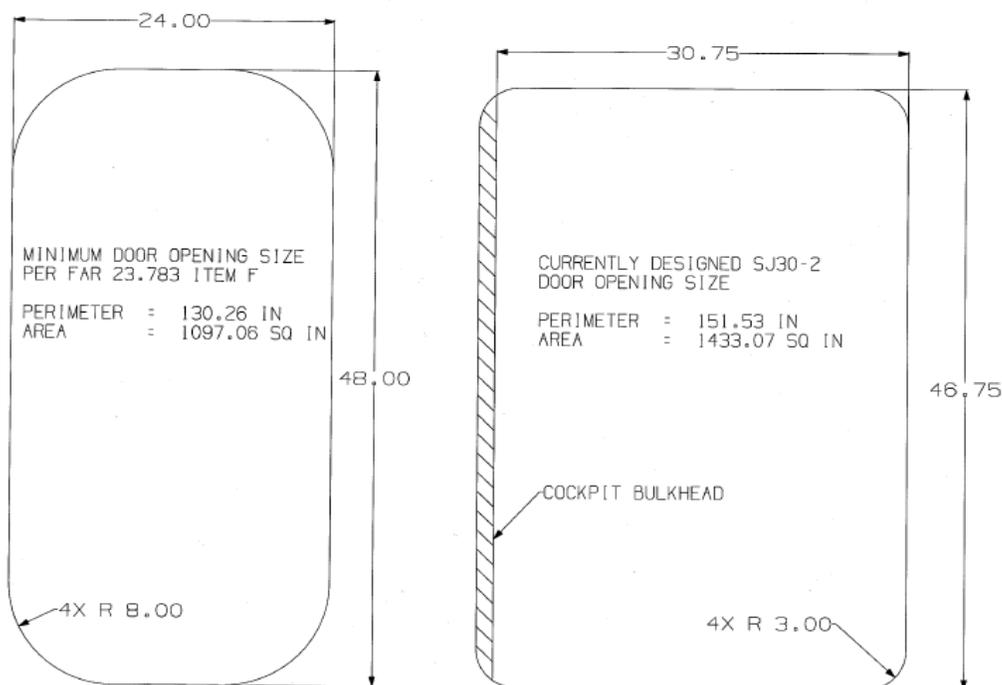
BACKGROUND:

Equivalent Level of Safety (ELOS) ACE-98-3 was issued as a result of a design review of the main cabin door. The door opening did not meet the height requirements of 14 CFR § 23.783(f)(1). The SJ30-2 door opening height is 46.75 inches, 1.25 inches less than the regulatory 48 inches required.

The design review also disclosed that the opening width was 32 inches, 8 inches wider than the 24 inches as required by 14 CFR § 23.783(f)(1), with the corner radius of 3 inches, which is less than the regulatory requirement of no greater than $1/3^{\text{rd}}$ of the width of the exit. This 8 inch increase in width and small 3 inch corner radius provided the necessary compensating factors for an equivalent safety finding (ELOS ACE-98-3).

With the addition of the cockpit bulkhead, the width of the opening has been reduced from 32 inches to 30.75 inches.

Figure A depicts the 14 CFR § 23.783(f)(1) design requirement. Figure B depicts the ELOS ACE-98-3 opening with the encroachment of the cockpit bulkhead.



STATEMENT OF ISSUE: (Equivalent Level of Safety)

The completed SJ30-2 aircraft interior includes a bulkhead to separate the cockpit from the remainder of the cabin. In its installed position, the bulkhead encroaches approximately 1.25” into the forward edge of the opening of the main cabin doorway. This encroachment reduces the effective width of the main cabin door as previously approved in ELOS Finding No. ACE-98-3.

APPLICABLE REGULATION:

The applicable regulation is 14 CFR § 23.783(f)(1), which states:

Section 23.783 Doors

- (f) In addition, for commuter category airplanes, the following requirements apply:
- (1) Each passenger entry door must qualify as a floor level emergency exit. This exit must have a rectangular opening of not less than 24 inches wide by 48 inches high, with corner radii not greater than one-third the width of the exit.

APPLICANT'S POSITION:

Description of Compensating Design Features

Compensating factors, which Sino Swearingen believes provides an equivalent level of safety to the requirements of 14 CFR § 23.783(f)(1) as required by § 21.21(b)(1) for the Model SJ30-2, are summarized in the following paragraphs. Rationale is presented to support a finding of equivalent safety.

As originally certified without the interior, the main cabin door of 32 inches in width, 46.75 in height, and a corner radius of 3 inches met the requirements for issuance of ELOS ACE-98-3 in 1998. The main cabin door, under that ELOS, had an opening of 1,488 square inches, resulting in a “margin” of 36% over the regulator requirements. This is the current certification basis for the SJ30-2.

With the installation of the cockpit bulkhead, 1.25 inches in main cabin door opening width is lost by the encroachment of the bulkhead into the forward edge of the main cabin door opening. The net effect is a door opening width of 30.75 inches, and a total area of 1,433 square inches. This effective door opening now has a “margin” of 30.6% over the regulatory requirement.

The 3-inch radius at the corners remains structurally unchanged. The cockpit bulkhead encroaches only in the inside of the aircraft on the forward edge of the main cabin door opening, that is, the projected effective door area available for evacuation is reduced.

How design features or alternative standards provide an equivalent level of safety intended by the regulation

With the installation of the cockpit bulkhead, 1.25 inches in main cabin door opening width is lost along the forward edge of the main cabin door. The net effect is a door opening width of 30.75 inches, and a total area of 1,433 square inches. The remaining door opening area has a “margin” of 30.6% over the regulatory requirement.

FAA POSITION:

The FAA concurs with the applicant's assessment that the emergency evacuation would remain successful as intended by the regulation. The FAA considers this reduction in effective projected opening area to be a small and inconsequential impact on intended evacuation requirements. The Door opening area with a margin of 30.6% over the regulatory requirement continues to be sufficient to adequately offset the lower height.

RECOMMENDATION:

Based on the SSAC showing of the compensating features of their design, we recommend the issuance of this equivalent level of safety finding to 14CFR 23.783(f)(1), for the airplane Model SJ30-2.

CONCURRENCES:

The FAA concurs.

<i>Michele M. Owsley</i>	<i>3/8/06</i>
Manager, Airplane Certification Office, ASW-150	Date

<i>John Colomy</i>	<i>4/4/06</i>
Manager, Standards Office, ACE-110	Date

<i>James E. Jackson</i>	<i>4/5/06</i>
Acting Manager, Small Airplane Directorate, ACE-100	Date