



Federal Aviation Administration

Memorandum

Date: July 21, 2015

To: Manager, Project Support Branch, ACE-112

From: Manager, Small Airplane Directorate, ACE-100

Prepared by: Doug Rudolph, Project Support Branch, ACE-112

Subject: INFORMATION: Equivalent Level of Safety (ELOS) Finding for HAFEI Aviation Industry Co., Ltd., Model Y12F Airplane, Landing Gear Handle Location, Project #: TC0256CE-A

ELOS Memo #: ACE-15-16

Regulatory Ref: 14 CFR 23.777(g) at amendment 23-51

This memorandum informs the certificate management aircraft certification office of an evaluation made by the Accountable Directorate on the establishment of an equivalent level of safety finding for the landing gear handle location on the HAFEI Aviation Industry Co., Ltd. (HAFEI), Model Y12F airplane.

Background:

The HAFEI Y12F is a non-pressurized, twin-engine turbo-propeller, part 23 commuter category airplane. The airplane is designed for a crew of two and a maximum of 19 passengers with a maximum takeoff weight of 8,400 kg (18,519 lbs.). The Y12F is powered by two wing mounted Pratt & Whitney Canada PT6A-65B engines with five-bladed Hartzell HC-B5MP-3/M10876AN (K)(S) propellers.

The aircraft is predominantly metallic construction. Composite materials are used for the ailerons, rudder, elevator, cowlings, and doors. The Y12F airplane is a conventionally configured high wing monoplane with a single vertical fin and retractable tricycle landing gear. The aircraft is multi-piloted and equipped with the Honeywell Primus Apex™ Electronic Flight Instrument System (EFIS).

During the Federal Aviation Administration (FAA) validation flight test program of the Y12F airplane, it was noted that the landing gear handle position was not in literal compliance with § 23.777, Cockpit controls, paragraph (g). Refer to figure 1 for the Y12 flight deck with positions of the landing gear handle (1) depicted to the right-hand side of the throttle centerline (2) and pedestal centerline (3). This is a concurrent validation with the Civil Aviation Administration of

China (CAAC) type certification of this new model airplane. The CAAC has granted an ELOS for this situation on their forthcoming new type certificate.



Figure 1: Y12 Flight Deck

Applicable regulations:

14 CFR 23.777(g)

Regulation requiring an ELOS finding:

14 CFR 23.777, Cockpit controls, paragraph (g) states the following:

“The landing gear control must be located to the left of the throttle centerline or pedestal centerline.”

Description of compensating design features or alternative Methods of Compliance (MoC) which allow the granting of the ELOS (including changes, limitations, or equipment needed for equivalency):

The Y12F airplane is designed to be a commuter category airplane, which will require a type rating and is also be type certificated as requiring a two-man crew. Additionally, HAFEI conducted a human factors evaluation and found this design configuration to be acceptable. The FAA also verified this installation during their FAA validation flights and found it acceptable.

Since the airplane is designed as a minimum two crew, the landing gear handle is operated by the copilot, so the landing gear is located to the right of the centerline of the instrument panel. The requirement for the copilot to operate this handle is defined in the Quick Reference Handbook

(QRH). The Aircraft Flight Manual (AFM) limitation section specifies that the, “Minimum crew is two pilots: the pilot and the copilot. The pilot’s seat is in the left side of cockpit, and copilot’s seat is in the right side of cockpit.” Additionally, since this airplane will be type rated, the requirement for the copilot on the right side of the cockpit is to operate the landing gear handle and will be part of the type training.

As previously stated, a human factors study was conducted and verified that the location of the handle to the right of centerline of the instrument panel can still be reached by the pilot in the left-hand seat (figure 1) while the seat belt is fastened.

Explanation of how design features or alternative Methods of Compliance (MoC) provide an equivalent level of safety intended by the regulation:

The FAA has determined that an ELOS finding is appropriate for the landing gear handle location on the Y12F airplane due to the fact that the airplane will be a two-man crew operation that requires type rating training and the fact that the pilot can reach the handle in all aspects of flight operation, if needed.

CAAC agrees with HAFEI that this design meets the requirement of an ELOS and this is documented in FAA Issue Paper S-14, Stage 4.

FAA approval and documentation of the ELOS finding:

The FAA has approved the aforementioned equivalent level of safety finding in project issue paper S-14. This memorandum provides standardized documentation of the ELOS finding that is non-proprietary and can be made available to the public. The Accountable Directorate has assigned a unique ELOS Memorandum number (see front page) to facilitate archiving and retrieval of this ELOS. This ELOS Memorandum number must be listed in the Type Certificate Data Sheet under the Type Certificate (TC) and Amended Type Certificate (ATC) or in the Limitations and Conditions section of the Supplemental Type Certificate (STC). An example of an appropriate statement is provided below.

Equivalent Level of Safety Findings have been made for the following regulation:

14 CFR 23.777, Cockpit controls, paragraph (g)
(documented in ELOS Memo ACE-15-16)

//SIGNED//

Earl Lawrence, Manager, Small Airplane Directorate,
Aircraft Certification Service

July 21, 2015

Date

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