



Federal Aviation Administration

Memorandum

Date: May 29, 2015

To: Manager, Wichita ACO, ACE-115W

From: Manager, Transport Airplane Directorate, ANM-100

Prepared by: Tina Miller, ACE-117W

Subject: INFORMATION: Equivalent Level of Safety (ELOS) Finding for Emergency Exit Signs on Cessna Model 680 and Model 680A Airplanes, FAA Project Numbers TC2548WI-T and Cessna-072100

ELOS Memo # TC2548WI-T-AG-4

Regulatory Ref: 14 CFR 21.21(b)(1), 25.811(d)(1), and 25.812(b)(1)

This memorandum informs the certificate management aircraft certification office of an evaluation made by the Transport Airplane Directorate (TAD) on the establishment of an equivalent level of safety (ELOS) finding for Cessna Model 680 and Model 680A airplanes.

Background

The Model 680 is certified for 13 passengers in addition to 2 crewmembers. Cessna requested an ELOS finding to:

- 1) Title 14, Code of Federal Regulations (14 CFR) 25.812(b)(1) for the reduction of the background area requirement of the main cabin door exit locator/marketing sign, the escape hatch emergency exit locator/marketing sign, and the divider escape hatch emergency exit locator sign, and
- 2) Section 25.811(d)(1) for allowing the exit signs to serve as both an exit marking sign and an exit locator sign. Although, all of the aforementioned exit locator/marketing signs comply with all of the regulations for aircraft having 9 or less passengers (§ 25.812(b)(2)), the Model 680, having a maximum seating passenger capacity of 13 passengers, will comply with the regulations of § 25.812(b)(1), with the exception of the background areas.

Cessna subsequently requested to extend the ELOS finding to include Model 680A airplanes, based on the same rationale, except that the Model 680A will be certificated for only 9

passengers in addition to 2 crewmembers and directly complies with § 25.812(b)(1) as it has fewer than 10 passengers and therefore that part of the ELOS finding is not required for the Model 680A. For the aft emergency exit, the divider sign required by § 25.811(d)(3) is used as the locator sign required by § 25.811(d)(1). The Model 680A has a cabin layout that is similar to the Model 680, except the number of passengers. Therefore, this portion of the ELOS finding is still required.

Applicable regulation(s)

14 CFR 21.21(b)(1), 25.811(d)(1), and 25.812(b)(1)

Regulation(s) requiring an ELOS finding

14 CFR 25.811(d)(1) and 25.812(b)(1)

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

Compensating factors which provide an ELOS to the requirements of §§ 25.812(b)(1) and 25.811(d)(1) for the Model 680 and Model 680A are summarized as follows:

- The attention getting characteristics of the configuration meet or exceed the requirements of § 25.812(b)(1) in the areas of total illumination intensity as well as contrast.
- The Model 680 cabin is diminutive in size with respect to the size of cabins contemplated in the intent of § 25.812(b)(1). In addition, the Model 680 has a single row of seats on each side of the aisle and a cabin width equal to the Model 650 and the Model 750 (5.5 feet). This cabin size creates a condition in which all exit locator and marking signs become easily legible (seen and read).
- Similar and/or identical exit signs were previously granted an ELOS finding for similar aircraft. The Model 680 and Model 680A have less than or equal to cabin lengths of other approved aircraft with similar configurations and therefore, the exit signs are considered a more appropriate design.
- The exit locator sign and both exit marking signs meet all of the requirements of § 25.812(b)(2), which covers 9 passengers or less (excluding crew). The Model 680 will be certified for 13 passengers (plus 2 crew), an increase of only four passengers. Again, the Model 680 is small compared to the average size of aircraft in the large aircraft (transport) category. The Model 680's cabin length is identical for passenger seating configurations of 9 passengers or less and for 10 passengers or more. Therefore, the viewing distance is the same regardless of the passenger capacity. The Model 680A will be certified for 9 passengers (plus 2 crew).
- The exit locator sign and the exit marking signs are installed in the most appropriate locations for the seating configurations. Each of the signs can be seen and read from the most adverse position for which their use were intended.

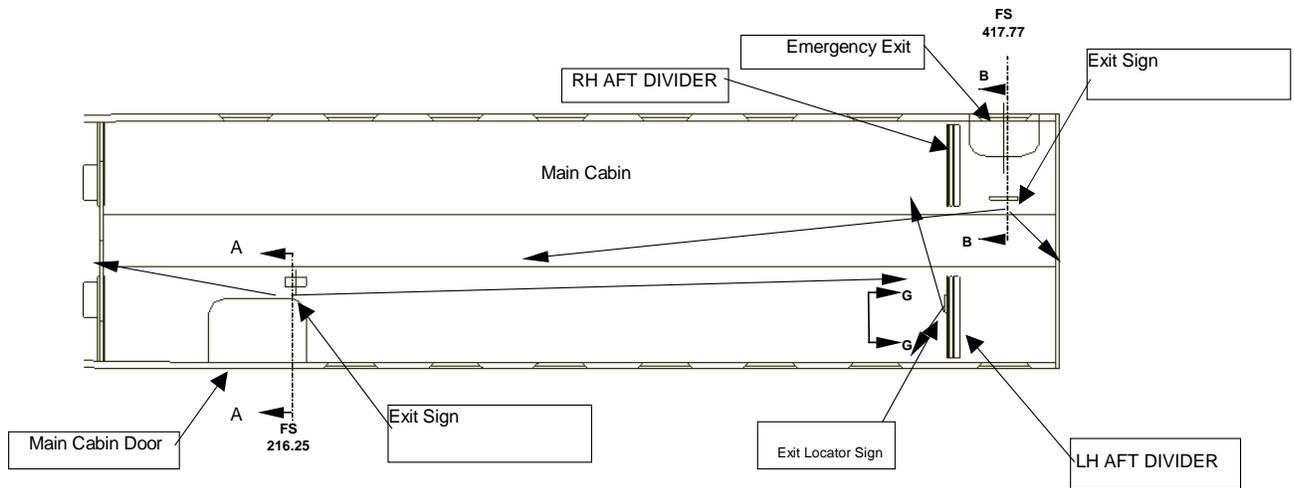
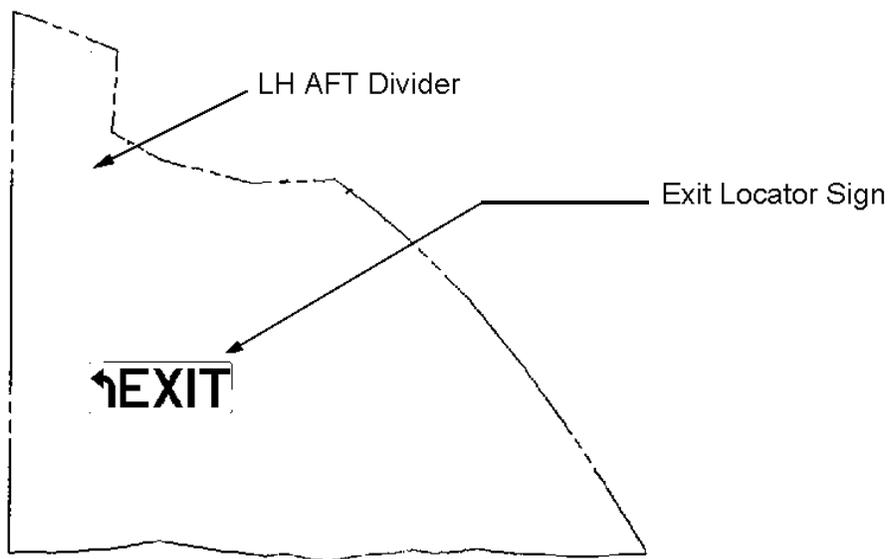


FIGURE 1
TOP VIEW OF MODEL 680 WITH VIEWING ANGLES



Note: Not to Scale

FIGURE 2
LH AFT DIVIDER - EXIT LOCATOR SIGN INSTL.

VIEW G-G FIG. 1

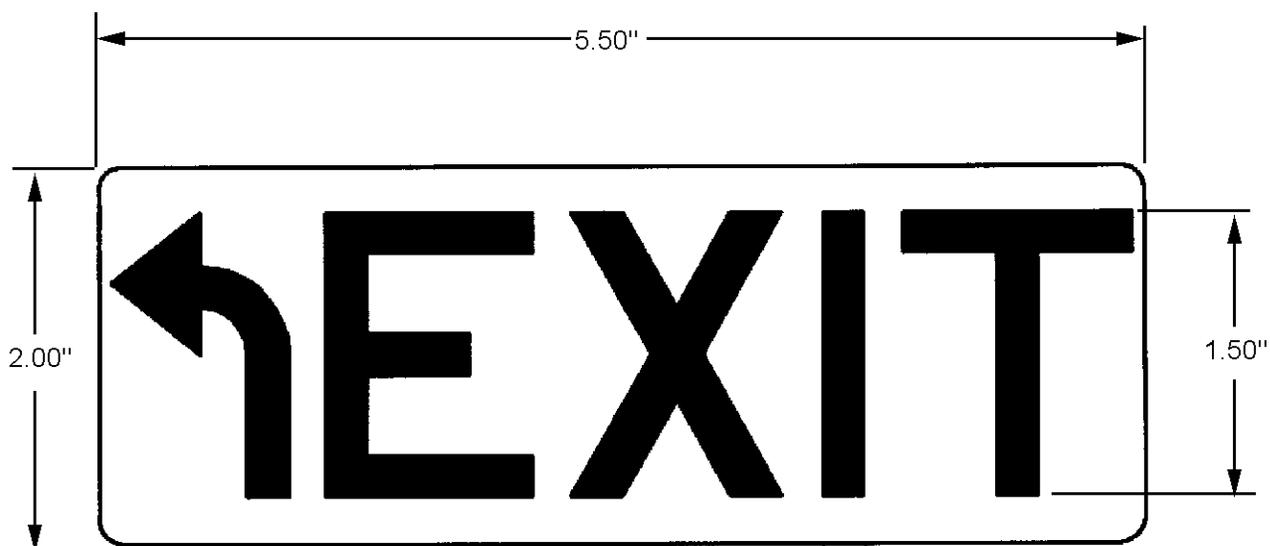


FIGURE 3
EXIT LOCATOR SIGN ASSY

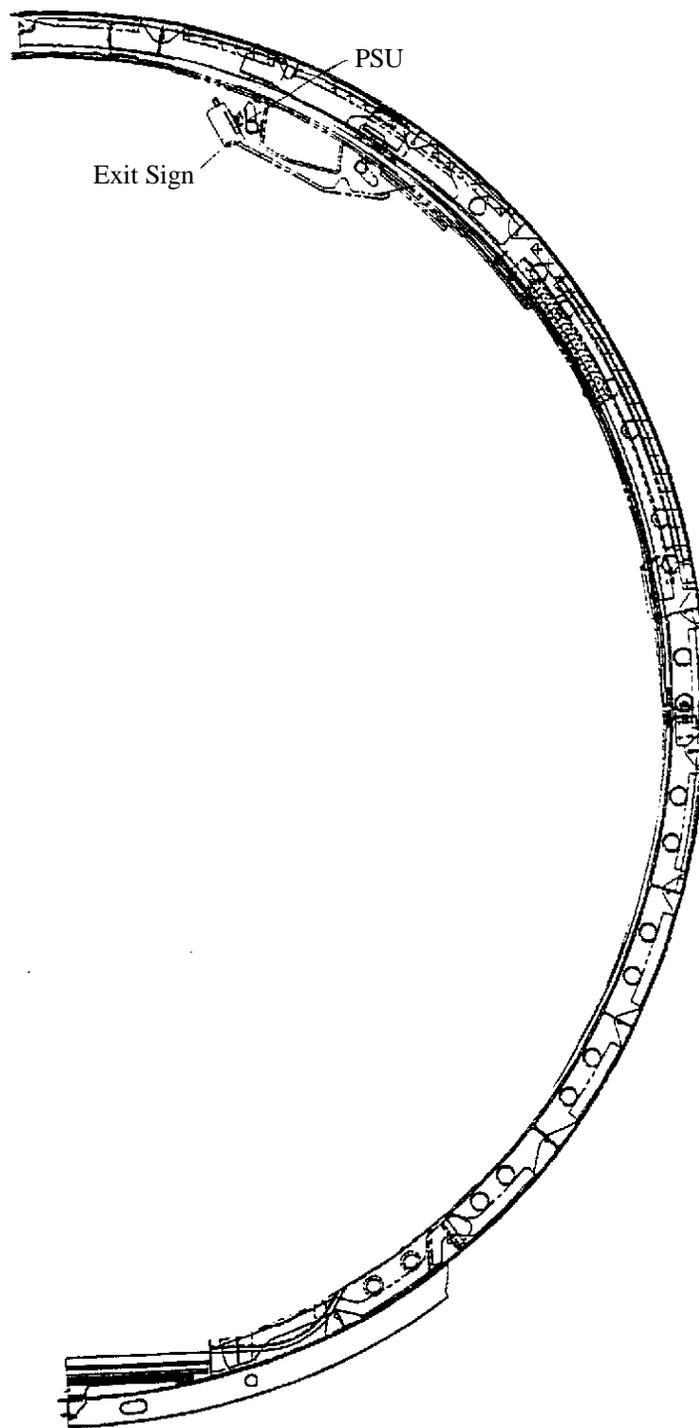


FIGURE 4
EXIT LOCATOR/MARKING SIGN
EMERGENCY ESCAPE HATCH
VIEW B-B FIG. 1

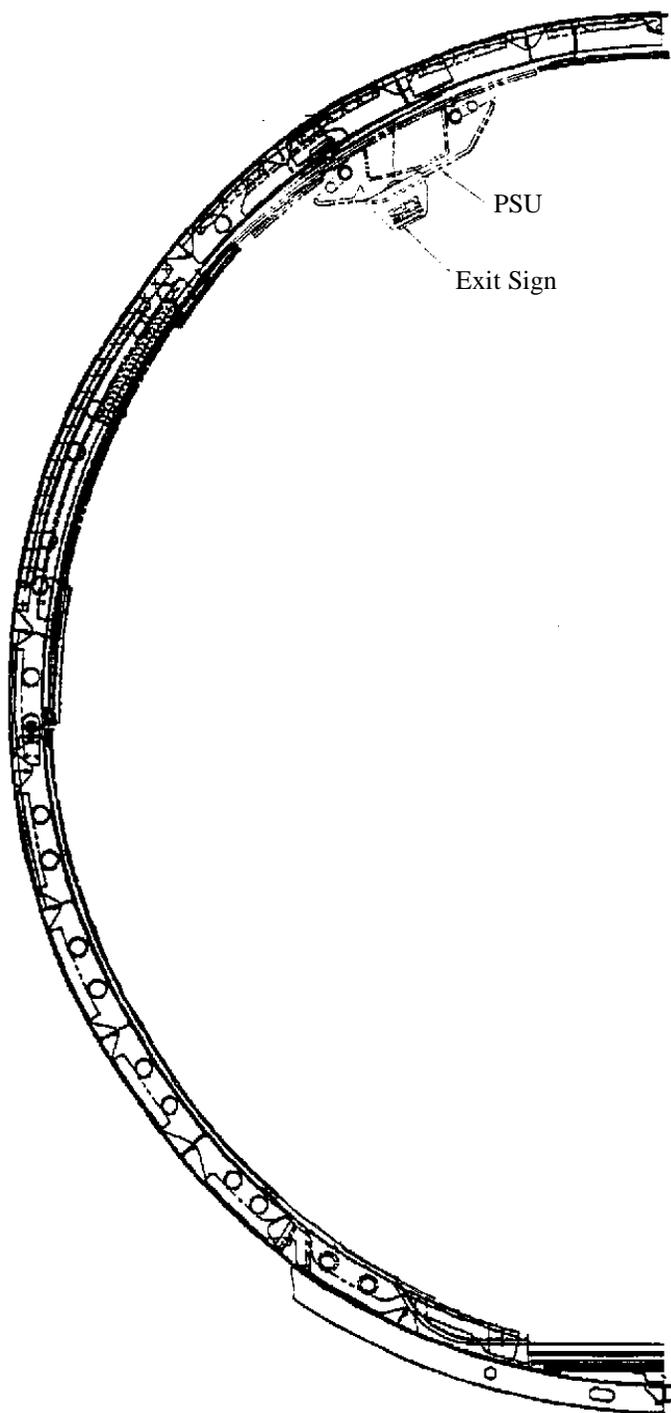


FIGURE 5
EXIT LOCATOR/MARKING SIGN
MAIN PASSENGER CABIN DOOR
VIEW A-A FIG. 1

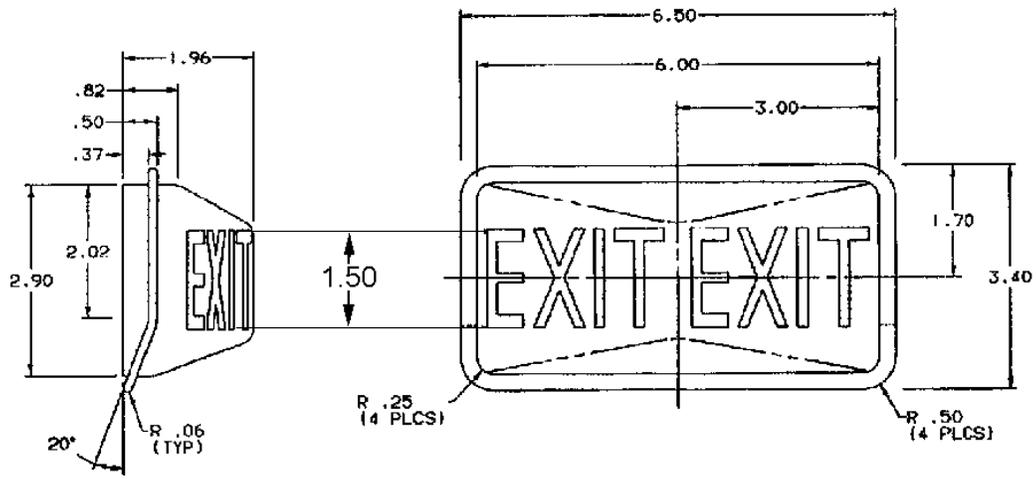


FIGURE 6
EXIT LOCATOR/MARKING SIGN

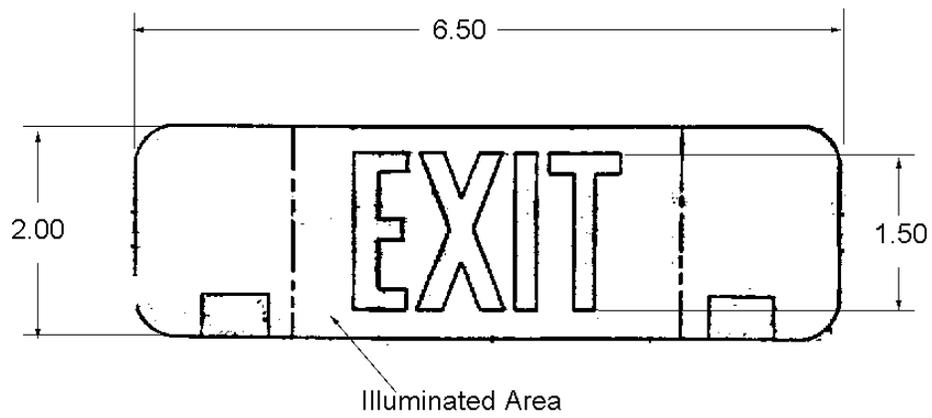


FIGURE 7
EXIT LOCATOR/MARKING SIGN

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

The Model 680 aircraft maintains the interior fuselage diameter of existing Models; 560XL, 650 and 750's fuselage. The Model 680 will be certified for 13 occupants, plus two crew members. The main cabin door and the emergency escape hatch are located as shown in FIGURE 1.

The Cessna 680A interior fuselage diameter is approximately 10 inches wider than the 680 interior fuselage. The Model 680A will be certified for 9 passengers plus 2 crew members.

MAIN PASSENGER CABIN DOOR:

The Exit Locator/Marking Sign (Ref. FIGURE 6) is installed above the main cabin door (FIGURE 5). The sign is a wedge shaped (2 flat illuminated white surfaces) sign with the word "EXIT" printed, in red, on both surfaces. This exit sign can be easily read and seen from any aisle position in the aircraft as shown in the viewing angles in FIGURE 1. This sign functions as both an Exit Locator Sign {§ 25.811(d)(1)} and as an Exit Marking Sign {§ 25.811(d)(2)}. This sign meets all of the requirements of § 25.812(b)(1)(i) with the exception of the background area. This sign may also be installed above the Type III Emergency Exit in the case of a floorplan with no dividers and high density configuration.

TYPE III EMERGENCY EXIT

The Type III Emergency Exit escape hatch for the Model 680 is located on the RH side of the Aft vanity area. For the standard floorplan, it's view is obstructed by a divider panel, preventing a passenger occupying a seat in the main cabin from directly seeing the escape hatch and the exit marking sign. (FIGURE 1). Therefore, the location of the escape hatch is marked by an Exit Locator Sign {§ 25.811(d)(1) and (3)} and an Exit Marking Sign {§ 25.811(d)(2)}. There is an exit locator sign installed on the forward side of the LH Aft Divider and there is an exit marking sign above the Type III Emergency Escape Hatch. The exit sign installed above the emergency exit serves two functions; an Exit Locator Sign {§ 25.811(d)(1)} and as an Exit Marking Sign {§ 25.811(d)(2)}. As shown in FIGURE 1, an occupant can obviously see and read the exit sign from the aisle in front of the exit and from the doorway that enters the aft vanity.

EXIT LOCATOR SIGN:

The Exit Locator Sign Assembly is installed on the forward side of the LH AFT Divider as shown in FIGURE 2. The exit sign is composed of red letters ("EXIT") on an illuminated white background. The Exit Locator Sign is located at a position in which any occupant whose height is between the 95th percentile male to the 5th percentile female can clearly see and read (the sign). The sign meets all of the requirements of § 25.812(b)(1)(i) as it pertains to § 25.811(d)(3), with the exception of the background area.

EXIT MARKING SIGN:

The Exit Marking Sign is centered above the emergency escape hatch (FIGURES 1 and 4). As previously mentioned, this dual function (Exit Locator and Exit Marker) sign is installed per the requirements of § 25.811(d)(1) and (2). The sign is made of 1 1/2" red letters on a illuminated white background. The exit sign can be seen and read from any position in the lavatory and from

the doorway entrance into the aft lavatory. This exit marking sign is identical to the exit sign certified for use on the Model 650 aircraft per an ELOS finding.

The Models 650 and 680 have similar fuselage diameters and cabin lengths. The exit marking sign complies with all requirements of § 25.812(b)(1) with the exception of the background area.

FAA approval and documentation of the ELOS finding

The FAA has approved the aforementioned ELOS finding in Model 680 project issue paper AG-4 and Model 680A project issue paper G-5. This memorandum provides standardized documentation of the ELOS finding that is non-proprietary and can be made available to the public. The TAD 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 Certification Basis section. An example of an appropriate statement is provided below.

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

14 CFR 25.811(d)(1) Emergency exit marking, and

14 CFR 25.812(b)(1) Emergency lighting

(documented in TAD ELOS Memo TC2548WI-T-AG-4)



 Transport Airplane Directorate,
 Aircraft Certification Service



 Date

ELOS Originated by Wichita ACO	Tina Miller	ACE-117W
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