



Federal Aviation Administration

Memorandum

Date: October 6, 2015

To: Manager, New York ACO, ANE-170

From: Manager, Transport Airplane Directorate, ANM-100

Prepared by: Fabio Buttitta, ANE-171

Subject: INFORMATION: Equivalent Level of Safety (ELOS) Finding for Symbolic Exit Signs on Model BD-500-1A10 / -1A11, FAA Project # TC4948NY-T

ELOS Memo#: TC4948NY-T-CS-10

Regulatory Ref: Title 14, Code of Federal Regulations, (14 CFR) 25.811(g) 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 the Bombardier Aerospace (BA) Model BD-500-1A10 and BD-500-1A11 aircrafts.

Background

Bombardier Aerospace Inc. has proposed to install symbolic exit signs on the Model BD-500-1A10 and BD-500-1A11 aircraft, instead of the conventional red text based exit signs as required by the existing Federal Aviation Administration (FAA) regulations. This type of symbolic exit sign is currently permitted by the European Aviation Safety Agency (EASA) certification specifications.

In March 2003, the Joint Aviation Authorities (JAA) adopted Notice of Proposed Amendment (NPA) 25D-327 to allow the use of symbolic exit signs as an alternative to language based signs. EASA (the successor to the JAA) used the JAA work and published their own NPA, which was later adopted into their Certification Specifications. The symbolic signs, accepted as a means of complying with the revised EASA regulations, were derived from international standards for symbols and were the subject of a comprehension study performed by Cranfield University. The Cranfield University study results, published in April 1997, were used by the JAA, and subsequently EASA, to conclude that some of the symbolic signs evaluated were sufficiently understood by members of the traveling public to be put into use. The level of comprehension of the symbolic signs as compared to the language based signs varied and was dependent on the type of sign.

The FAA existing regulations for textual exit signs read as follows:

- Title 14 Code of Federal Regulations (14 CFR) section 25.811(d) states, “The location of each passenger emergency exit must be indicated by a sign visible to occupants approaching along the main passenger main aisle (or aisles).”
- Section 25.811(g) states, “Each sign required by paragraph (d) of this section may use the word exit in its legend in place of the term emergency exit.”
- Section 25.812(b)(1)(i) states, “Each passenger emergency exit locator sign required by § 25.811(d)(1) and each passenger emergency exit marking sign required by § 25.811(d)(2) must have red letters at least 1 ½ inches high on an illuminated white background, and must have an area of at least 21 square inches excluding the letters.
- Section 25.812(b)(1)(ii) states, “Each passenger emergency exit sign required by § 25.811(d)(3) must have red letters at least 1 ½ inches high on a white background having an area of at least 21 square inches excluding the letters.”

Applicable regulation(s)

§§ 25.811, 25.812

Regulation(s) requiring an ELOS finding

§ 25.811(g), 25.812(b)(1)(i) and 25.812(b)(1)(ii)

Description of compensating design features or alternative standards which allow the granting of the ELOS (including design changes, limitations or equipment need for equivalency)

In conjunction with the actions listed below, symbolic exit signs are found to be equivalent to the text signs required by the existing FAA regulations based on the following compensating feature:

- The use of symbolic exit signs can increase safety by providing an exit symbol that will be understood by all aircraft passengers, regardless of their native language.

Accomplishing the following actions will establish an overall comprehension of the symbolic exit signs by the flying public:

- Incorporation of an FAA-accepted special emphasis briefing to be included in the airplane flight manual along with the requirement that the briefing be given to the passengers prior to each flight and prior to each landing.
- Development of an FAA-accepted implementation plan that will ensure incorporation of appropriate symbolic exit sign information into the standard passenger information cards, such as those required by §§ 121.571 (b), 135.117(e), and 91.1 035(f) at each passenger

seat place occupied for taxi, takeoff and landing. The specific exit sign artwork, placards and graphics identified in this plan must also be incorporated as part of the airplane type design.

- The symbolic exit signs must be evaluated on board the aircraft to ensure that there are no visual cues in the vicinity of the signs (e.g., symbolic signs or placards such as lavatory occupied signs) that could inadvertently mislead passengers away from the exits. Illumination of the symbolic signs must also provide equivalent visibility to the illumination levels specified for the text based signs.

Explanation of how design features or alternative standards provide an equivalent level of safety to the level of safety intended by the regulation

Since not all passengers are English speaking, and may not understand the word “Exit,” the use of symbolic exit signs can increase safety by providing a common exit symbol that does not require knowledge of the English language. However, the comprehension of the symbolic signs requires reinforcement in order to provide an ELOS. Research has shown that exposure to such symbols significantly increases comprehension, and exposure in context is a very effective means to accomplish this. Specifically, the FAA determined that special emphasis briefings must be utilized to explain the symbolic signs to passengers, as discussed above. The FAA also determined that special emphasis briefings must include passenger review of an information card containing the text meaning of the signs.

Through the above compensating features, symbolic exit signs provide an ELOS intended by the regulations.

FAA approval and documentation of the ELOS finding

The FAA has approved the aforementioned ELOS finding in project Issue Paper CS-10. 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 should be listed in the type certificate data sheet under the certification basis section.

Original signed by Suzanne Masterson

10/6/15

Transport Airplane Directorate,
Aircraft Certification Service

Date

ELOS Originated by NYACO:	ACO Manager Gaetano Sciortino	Routing Symbol ANE-170
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