



Federal Aviation Administration

Memorandum

Date: January 3, 2011

To: Manager, Seattle Aircraft Certification Office, ANM-100S

From: Manager, Transport Airplane Directorate, ANM-100

Prepared by: Susan L Monroe, ANM-150S

Subject: INFORMATION: Equivalent Level of Safety (ELOS) Finding for the Boeing Model 737-700 AEW&C Equipment Standards for Oxygen Dispensing Units (FAA Project No. ST3957SE-T)

ELOS Memo#.: ST3957SE-T-C-2

Reg. Ref.: §§ 21.21(b)(1) and 25.1447(c)(1)

The purpose of this memorandum is to inform the certificate management aircraft certification office of an evaluation made by the Transport Airplane Directorate on the establishment of an equivalent level of safety finding (ELOS) for the Boeing Model 737-700 Airborne Early Warning & Control (AEW&C) airplane.

Background

Boeing has submitted a request for an equivalent safety finding to Title 14 Code of Federal Regulations (14 CFR) 25.1447(c)(1) for the Model 737-700 AEW&C airplane.

Boeing applied for a supplemental type certificate (STC) to modify the Boeing Model 737-700 Increased Gross Weight (IGW) airplane for an AEW&C system. The 737-700 AEW&C is designed for up to 18 military mission crewmembers and no revenue passengers.

Section 25.1447(c)(1) requires:

- an oxygen dispensing unit connected to oxygen supply terminals, immediately available to each occupant, wherever seated,
- at least 10 percent more dispensing units in the cabin than seats with extra units uniformly distributed throughout the cabin, and

- the ability for the crew to manually make oxygen dispensing units immediately available to occupants, in the event the automatic system fails.

Applicable regulation(s)

§§ 21.21(b)(1) and 25.1447(c)(1)

Regulation(s) requiring an ELOS finding

§ 25.1447(c)(1)

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

The FAA has considered the 737-700 AEW&C oxygen dispensing system design, and has determined that there are sufficient compensating factors to grant an ELOS as defined below for § 25.1447(c)(1):

- The 737 AEW&C is not being certified for revenue passengers, not for hire, and not for common carriage.
- Occupants are restricted to essential mission crew or other extensively trained military personnel.
- Supplemental oxygen equipment installed with connected masks is located so that each occupant can don a mask and can simply activate the oxygen flow while seated.
- To meet the 10% excess requirement, portable oxygen equipment is installed for use as supplemental oxygen and is installed with the masks connected. The quantity of portable oxygen masks will be equal to or greater than 10% of the occupant seats and will be evenly distributed throughout the cabin.
- The mission crew mask/stowage box assembly includes features allowing for the mask to be removed and donned with one hand and mask hose length is adequate for its intended function.
- An automatically activated aural and visual decompression warning to notify the occupants when to don oxygen masks is installed. It is immediately recognizable throughout the cabin, including the lavatory and crew rest compartment.
- The pre-flight briefing will include instructions for locating and procedures for donning a mask and activating oxygen flow.

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

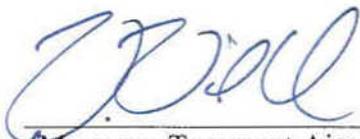
The FAA considers the compensating features noted above, regarding the oxygen dispensing units, to provide an ELOS to the requirements in § 25.1447(c)(1).

Since all occupants are essential crew or military personnel who are briefed prior to flight (and there are no revenue passengers) each occupant will be extensively trained to respond in an emergency. Aural and visual warnings are installed instructing occupants to don oxygen masks, making the need to don oxygen masks unmistakable. A sufficient supply of oxygen for mission crewmembers and additional masks to cover 10 percent excess are located so occupants can don and activate while seated. Notification of no-flow, demand flow and continuous flow are provided directly to crew member as part of the oxygen system so occupants can locate working equipment if needed. Quick donning masks require only one hand to don and the system is active and ready to use at all times.

FAA approval and documentation of the ELOS finding

The FAA has approved the aforementioned ELOS finding in project issue paper C-2. This memorandum provides standardized documentation of the ELOS finding that is non-proprietary and can be made available to the public. The Transport Airplane Directorate (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 limitations and conditions section of the supplemental type certificate. An example of an appropriate statement is provided below.

Equivalent Level of Safety Findings have been made for the following regulation(s):
§ 25.1447(c)(1) (documented in TAD ELOS Memo ST3957SE-T-C-2)



Manager, Transport Airplane Directorate,
Aircraft Certification Service

JANUARY 6, 2011

Date

ELOS Originated by Seattle ACO:	Project Engineer Susan Letcher	Routing Symbol ANM-150S
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