



Federal Aviation Administration

Memorandum

Date: January 28, 2016

To: Manager, New York Aircraft Certification Office, ANE-170

From: Manager, Transport Airplane Directorate, ANM-100

Prepared by: Stephen Kowalski, ANE-171

Subject: INFORMATION: Equivalent Level of Safety (ELOS) Finding for GA-A-02 on Model BD-700-2A12 & BD-700-2A13 airplanes, FAA Project # AT7180NY-T & AT7285NY-T

ELOS Memo #: AT7180NY-T-GA-A-02

Regulatory Ref: §§ 25.391, 25.395(b) and 25.415

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 Model BD-700-2A12 & BD-700-2A13 airplanes.

Background

In lieu of §§ 25.391 at amendment 25-86, 25.395(b) at amendment 25-72, and 25.415 at amendment 25-91, the applicant is requesting to substitute the corresponding EASA rules in CS 25 initial issue. Within the Aviation Rulemaking Advisory Committee (ARAC) forum, regulatory authorities and industry proposed revisions to ground gust requirements for control system and surface loads: §§ 25.391, 25.395, and 25.415. The technical aspects of this recommendation were agreed upon and accepted by the ARAC Loads and Dynamics Harmonization Working Group. The ARAC recommendation was incorporated by EASA CS-25 in its initial issue, and by the FAA in amendment 25-141. The certification basis of the Bombardier Inc. BD-700-2A12 and BD-700-2A13 Series Aircraft was established prior to the FAA's issuance of amendment 25-141. Therefore, this equivalent safety finding is necessary for §§ 25.391, 25.395(b) and 25.415 at the amendment levels prior to amendment 25-141, which were the amendment level of these rules included in the certification basis of the Bombardier Inc. BD-700-2A12 and BD-700-2A13 Series Aircraft.

Applicable regulation(s)

§§ 25.391, 25.395 and 25.415

Regulation(s) requiring an ELOS finding

§§ 25.391 amendment 25-86, 25.395(b) amendment 25-72 and 25.415 amendment 25-91

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

The requirement to consider the effects of ground gusts on control surface and control system loads has been applied to large transport category airplanes since 1950. The purpose of the requirement was to protect the flight control system from excessive peak ground wind loads while the airplane is parked or while taxiing downwind.

There were several incidents and accidents in the past caused by hidden damage that had previously occurred in ground gust conditions. Although many of these events were for airplanes that had used lower wind speeds from the earlier rules, analysis indicates that the most significant contributor to the damage was the dynamic load effect. The dynamic effects were most significant for control system designs in which the gust locks were designed to engage the control system at locations far from the control surface horn. Based on these events, additional factors are defined in the ARAC recommendations for use in those portions of the system and surface that could be affected by dynamic effects.

The applicant will use CS 25.391, 25.395(b) and 25.415 in lieu of 14 CFR 25.391 amendment 25-86, 25.395(b) amendment 25-72 and 25.415 amendment 25-91.

Explanation of how design features or alternative standards provide an ELOS to that intended by the regulation.

In accordance with FAA policy, an applicant may request the use of a mature ARAC proposal, in lieu of the corresponding requirement(s), as providing an equivalent level of safety. This issue paper documents the applicant's request and FAA finding. The ARAC proposed standards in this case provide a higher level of safety than the earlier rules.

FAA approval and documentation of the ELOS finding

The FAA has approved the aforementioned ELOS finding in project Issue Paper GA-A-02 titled Ground Gust Condition 14 CFR 25.391, 25.395(b) and 25.415. 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 finding. This ELOS memorandum

number should be listed in the type certificate data sheet under the Certification Basis section in accordance with the statement below:

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

§ 25.391 Control Surface Loads: General

§ 25.395(b) Control System

§ 25.415 Ground Gust Conditions

(documented in TAD ELOS Memorandum AT7180NY-T-GA-A-02)

Transport Airplane Directorate,
Aircraft Certification Service

Date

ELOS Originated by ACO:	ACO Manager	Routing Symbol:
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