



# Federal Aviation Administration

---

---

## Memorandum

Date: December 11, 2015

To: Manager, Transport Standards Staff, International Branch, ANM-116

From: Manager, Transport Airplane Directorate, ANM-100

Prepared by: Todd Martin, ANM-115

Subject: INFORMATION: Equivalent Level of Safety (ELOS) Finding for flight control system failure criteria on Dassault Model 5X series airplanes, FAA Project # TC00952IB-T

ELOS Memo #: TC00952IB-T-A-6

Regulatory Ref: § 25.671(c)(2)

---

---

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 Dassault Model 5X airplane.

### Background

Title 14, Code of Federal Regulations (14 CFR) section 25.671(c)(2) requires that the airplane is shown to be capable of continued safe flight and landing after “Any combination of failures not shown to be extremely improbable, excluding jamming (for example, dual electrical or hydraulic system failures, or any single failure in combination with any probable hydraulic or electrical failure).”

Dassault has proposed an ELOS finding to the requirements of § 25.671(c)(2) based on a proposal from the Aviation Rulemaking Advisory Committee (ARAC). The ARAC proposal provides guidelines on what should be an acceptable risk level after the occurrence of any single failure in the flight control system.

## **Applicable regulation(s)**

§ 25.671(c)(2)

### **Regulation(s) requiring an ELOS finding**

§ 25.671(c)(2)

### **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 compensating factors that provide an equivalent level of safety for the regulations not complied with are as follows:

In lieu of compliance with § 25.671(c)(2), Dassault will meet the following criteria:

- I. The airplane must be shown to be capable of continued safe flight and landing after -  
“Any combination of failures not shown to be extremely improbable. Furthermore, in the presence of any single failure in the flight control system, any additional failure states that could prevent continued safe flight and landing shall have a combined probability of less than 1 in 1000.”
- II. Failure conditions that are classified as catastrophic and that occur as a result of a single failure plus a latent failure, must be highlighted in the system safety assessment, subject to review by the authority. This review will ensure that any such failure conditions are, in fact, extremely improbable by assessing 1) the failure rates and service history of each component, 2) the inspection type and interval for any component whose failure would be latent, and 3) any possible common cause or cascading failure modes.

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

The compensating factor(s) raise the level of safety to that required § 25.671(c)(2) by adopting a clear definition of acceptable risk level for subsequent failures, which has the advantage of 1) addressing latency, and 2) eliminating possible dubious judgments in the determination of probable failures.

### **FAA approval and documentation of the ELOS finding**

The FAA has approved the aforementioned ELOS finding in project Issue Paper A-6, titled Flight Control System Failure Criteria. 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):  
§ 25.671(c)(2), Control Systems; General  
(documented in TAD ELOS Memorandum TC00952IB-T-A-6)

*Original signed by Suzanne Masterson*

*12/11/15*

Transport Airplane Directorate,  
Aircraft Certification Service

Date

ELOS Originated by: Airframe/Cabin Safety Branch	Project Engineer: Todd Martin	Routing Symbol: ANM-115
--	----------------------------------	----------------------------