

Aircraft Lightning Direct Effects Certification

FOREWORD

Whenever a reference document appears in this Recommended Practice, it carries the minimum revision level of the reference document acceptable to meet the intended requirements. Later versions of the reference document are also acceptable but earlier versions are not acceptable. In all cases, other documents shown to be equivalent to the reference document are also acceptable.

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1. SCOPE:

This document provides guidance for a means of showing compliance with regulations for protection against lightning direct effects for aircraft of conventional design, as well as for those involving advanced composite structures or other new technologies. This guidance also applies to those aspects of aircraft systems and components not addressed in the regulations covering the protection of electrical/electronic systems (for example, FAR/JAR xx.1316) or fuel systems (for example, xx.954). The guidance provided in this document applies to initial designs as well as modifications.

1.1 Purpose:

The purpose of this document is to provide information and guidance concerning an acceptable means, but not the only means, of compliance with Parts 23, 25, 27, and 29 of the Federal Aviation Regulations (FAR) and Joint Aviation Regulations (JAR), applicable to aircraft for protection against the direct effects of lightning. Accordingly, this material is neither mandatory nor regulatory in nature and does not constitute a regulation. In lieu of following this method, the applicant may elect to establish an alternate method of compliance that is acceptable to the Federal Aviation Administration (FAA)/Joint Aviation Authorities (JAA) for complying with the requirements of Sections 23.867, 25.581, 27.610, (a) and 29.610(a), (b) and (c).

NOTE: This material does not explicitly cover fuel systems as required by FAR/JAR 23.954, 25.954, 27.954 and 29.954 or electrical/electronic systems as defined in 23.1309(e) 25.1316, 27.1309(d) and 29.1309(h).

This document is one of several documents related to the effects of lightning on aircraft. Figure 1 shows the relationship between the external environment, zoning of the aircraft, and testing requirements.

2. REFERENCES:

2.1 U.S. Federal Aviation Regulations (FAR) and European Joint Airworthiness Requirements (JAR):

Federal Aviation Regulations 14 CFR Parts 23.867, 25.581, 27.610, and 29.610
Joint Aviation Requirements Parts 25.X899, 23.867, 25.581, 27.610, and 29.610

2.2 Advisory Circulars:

2.2.1 FAA Advisory Circulars: The following documents can be obtained from the U.S. Department of Transportation, Subsequent Distribution Office, Ardmore East Business Center, 3341 Q 75th Avenue, Landover, MD 20785.

AC 23.1309-1C	Equipment, Systems, and Installations
AC 25.1309-1A	System Design and Analysis
AC 25.571-1C	Damage Tolerance and Fatigue Evaluation of Structure
AC 27-1B	Certification of Normal Category Rotorcraft
AC 29-2C	Certification of Transport Category Rotorcraft

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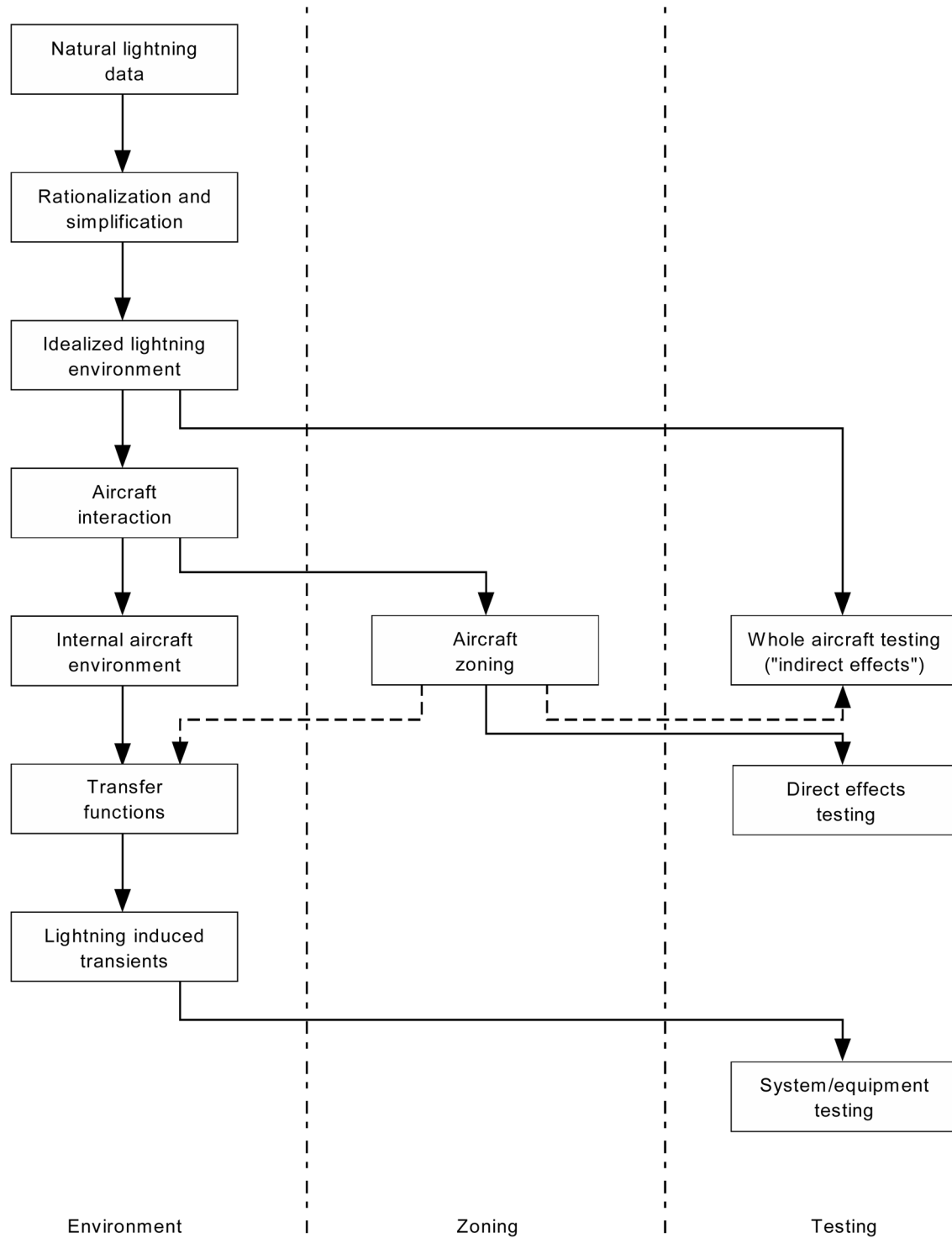


FIGURE 1 - Relationship Between Aircraft Environment, Zoning, and Testing

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2.2.2 Advisory Circulars Joint:

ACJ 25X899	Electrical Bonding and protection Against Lightning and Static Electricity
ACJ 29.610	Lightning and Static Electricity Protection
ACJ 25.581	Lightning Protection

2.3 Industry Documents:

2.3.1 SAE Publications: The following documents can be obtained from Society of Automotive Engineers (SAE), 400 Commonwealth Drive, Warrendale, PA 15096-0001 (www.sae.org).

ARP5414	Aircraft Lightning Zoning Standard
ARP5412	Aircraft Lightning Environment and Related Test Waveforms
Draft ARP5416	Aircraft Lightning Test Methods
ARP5415	User's Manual for Certification of Aircraft Electrical/Electronic Systems for the Indirect Effects of Lightning

2.3.2 Eurocae Publications: The following documents can be obtained from EUROCAE, 17, rue Hamelin, 75116 Paris (www.eurocae.org).

EUROCAE ED-14D	"Environmental Conditions and Test procedures for Airborne Equipment", Section 23 "Lightning Direct Effects", dated July, 1997
EUROCAE ED-91	Aircraft Lightning Zoning Standard", Rev A1, dated September, 1999
EUROCAE ED-84	"Aircraft Lightning Environment and Related Test Waveforms", Rev A1, dated May, 2001
EUROCAE Draft ED-105	"Aircraft Lightning Test Methods"

2.3.3 RTCA, Inc. Publications: The following documents can be obtained from RTCA, Inc., 1140 Connecticut Avenue, NW, Suite 1020, Washington, DC 20036-4001(www.rtca.org).

RTCA/DO-160D	"Environmental Conditions and Test procedures for Airborne Equipment", Section 23 "Lightning Direct Effects", dated July, 1997
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