

Characteristics of aircraft electrical supplies

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British Standard

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National foreword

This British Standard has been prepared under the direction of the Aerospace Standards Policy Committee and is the English language version of EN 2282:1992, "*Aerospace series. Characteristics of aircraft electrical supplies*", published by the European Committee for Standardization (CEN).

EN 2282 was produced as a result of international discussions in which the United Kingdom took an active part.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 20, an inside back cover and a back cover.

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English version

Aerospace series
Characteristics of aircraft
electrical supplies

Série aérospatiale
Caractéristiques de l'alimentation électrique
des aéronefs

Luft- und Raumfahrt
Eigenschaften der elektrischen
Stromversorgung von Luftfahrzeugen

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

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Foreword

This European Standard has been prepared by the European Association of Aerospace Manufacturers (AECMA).

After inquiries and votes carried out in accordance with the rules of this Association, this Standard has successively received the approval of the National Associations and the Official Services of the member countries of AECMA, prior to its presentation to CEN.

According to the Common CEN/CENELEC Rules, the following countries are bound to implement this European Standard:

Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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0 Introduction

This standard has taken into consideration national documents together with ISO 1540 and STANAG 3456.

1 Scope and field of application

This standard specifies the characteristics of electrical power supplied to the terminals of equipment installed in the aircraft.

It also defines the supply systems and compatibility requirements for equipment together with the special systems with constant and variable frequency.

This standard applies to a.c. and d.c. on-board or ground systems.

2 References

ISO 1540, *Aerospace — Characteristics of aircraft electrical systems*.

ISO 7137, *Aircraft — Environmental conditions and test procedures for airborne equipment*.

EN 3371, *Aerospace series — Bonding*¹⁾.

STANAG 3456, *Aircraft electrical system characteristics*²⁾.

STANAG 3516, *Electromagnetic compatibility for aircraft electrical and electronic equipment*²⁾.

MIL-STD-461, *Electromagnetic emission and susceptibility requirements for the control of electromagnetic interference*³⁾.

3 Definitions

3.1

definition document

standards or document giving the technical definition of equipment

3.2

electrical system (system)

an assembly constituted by the sources of electrical power, utilization equipment, safety devices and all common connections of the installation

3.3

power sources

they supply the power from one of the aircraft propulsion engines, a power conversion device, a ground support unit, or batteries

3.4

available power of a system

the power which can be used simultaneously under continuous steady-state conditions taking account of the specified conditions of use in the aircraft and the rated power of each power source

3.5

utilization equipment

any equipment or any functional group of units consuming electrical energy

3.6

normal operation

this covers all the conditions of a system in which the utilization equipment shall retain its performance during the missions intended for the aircraft

¹⁾ In preparation at the date of publication of the present standard.

²⁾ This standard is published by: NATO, Military Agency for Standardization (MAS), B-1110 BRUSSELS.

³⁾ This specification is published by: Department of Defense (DOD), the Pentagon, WASHINGTON, D.C. 20301.

a distinction shall be made:

— « normal frequent » operation, i.e. usual systematic operating conditions (steady-state or transient).

Examples: variations in speed of aircraft engines and/or load of system supply from the ground.

Start-up procedures are at the limit of this type of operation.

— « normal rare » operation, which may occur randomly a limited number of times in the equipment life.

Examples: anomalies of load or control, transfer or paralleling of sources, normal clearing of certain faults and switching of load or engine, more significant than « normal frequent ».

3.7

emergency operation

the condition of the portion of the electrical system remaining in service when the main power sources can no longer respond to requirements

emergency sources then used are accumulator batteries, converters or generators of limited power (not considered to be utilization equipment)

3.8

abnormal operation

the consequence of a failure or disturbance bringing about the loss or deterioration of the system characteristics which may then attain the limits provided by the protective devices

the extent and duration of this abnormal operation may escape inspection until the end of the flight

3.9

steady-state conditions

operating conditions of the system when only negligible changes in electrical parameters appear which are not due to any variation in load or any fault

3.10

voltage values

the value of the a.c. voltage is defined by the r.m.s. value measured between each phase and the neutral, the value of the d.c. voltage is defined by the mean arithmetical value measured between the positive terminal and earth

3.11

transients

momentary variations of a characteristic from its steady-state conditions. They result, for example, from the response of the generator regulator to a disturbance

brief undervoltages or interruptions due to switching, may be considered as transients

3.12

spikes

brief variations, also called voltage peaks, compared with steady-state conditions or transients which arise in the distribution system, for example, from switching of inductive loads

they generally produce a voltage peak and/or a wave train, the characteristics of which are dependent on relative impedances of the line, equipment and power source, and on the manner in which the interruption occurs

3.13

drift

this is a random and extremely slow variation in a controlled parameter inside the specified limits

the speed of variation or drift rate of the parameter is expressed in Hz/min or in V/min

3.14

modulations

the modulation of the parameter is the cyclic (generally non-sinusoidal) or random variation of its maximum value around a mean value in steady-state conditions

for a.c. power, the maximum value of modulation (of voltage or current) is the maximum difference between the peak values of the parameter measured on the most unfavourable phase and polarity