British Standard
G244 : 1989

UDC 629.7.064.5 : 621.315.3.004.53.005

British Standard Aerospace Series : Code of practice for

# Installation/repair of aircraft electrical interconnection systems

Série Aérospatiale
Code de bonne pratique pour l'installation et la réparation des réseaux électriques des avions

Luft- und Raumfahrt-Reihe
Leitfaden zum Einbau und zur Reparatur elektrischer Verbindungssysteme in Flugzeugen

## Contents



## Foreword

This code of practice has been prepared at the request of the aircraft industry under the direction of the Aerospace Standards Policy Committee.

In its present form it applies principally to civil and transport aircraft.

**Compliance with a British Standard does not of itself confer immunity from legal obligations.**



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## 1 Scope

This code of practice gives the preferred choice of electrical cables, splices, terminations, connectors and accessories and the methods of installing these elements in wiring system form. The guidance given in this document is intended for general applications where design standards are not provided by a recognized design authority. Such design authority may be implied where the design practices of an approved installation are followed in that same installation for the purposes of modifications or repair.

Attention is drawn to clause 3 'Limitations' of this document.

NOTE. The titles of the publications referred to in this code of practice are listed on the inside back page.

## 2 Definitions

For the purposes of this British Standard, the definitions given in BS 9520 for connectors and British Standard G 230 for electrical cables apply.

## 3 Limitations

Nothing written or implied in this code of practice should take precedence over any statutory requirement e.g. British Civil Airworthiness Requirements (BCAR) or Joint Airworthiness Requirements (JAR): Part 25 or in any specification which has been approved against such requirements.

## 4 Sources of supply and user responsibility

Material supplied as conforming to specifications referenced in this British Standard should be verified as meeting the full requirements of the specification. For Civil Aircraft the normal (preferred) system of procurement is by obtaining a certified release (Approved Certificate) from a CAA approved manufacturer. If such a manufacturer holds a CAA Design Approval he will able to offer a Declaration of Design and Performance (DDP as defined in British Standard 3 G 100: Part 1) and may, additionally, hold an Accessory Approval granted by the CAA certifying the design standard of the product.

For equipment obtained from sources not approved by the CAA the procedure defined in CAA notice number 11 should be observed.

Equipment conforming to an Aerospace British Standard 9000 specification should be obtained using the procedure defined in CAA Notice No. 39.

## 5 Installation groups

The design, modification and repair of wiring installations are considered for each of the following groups:

(a) engine harnesses;

(b) electrical power generation, heavy duty;

(c) airframe-non pressured SWAMP (severe wind and moisture problem) areas;

(d) general airframe;

(e) interconnection of systems;

(f) equipment wiring;

(g) radio frequency (coaxial);

(h) data bus.

## 6 Service life

The airframe electrical interconnection system and its components should be selected and installed such that their service life is not less than the aircraft structure. For civil aircraft this would normally be 60 000 flying hours or 15 years.

It should not however, be assumed that all elements of an interconnection system will always achieve this life and installations should be designed, as far as is practicable, to permit a satisfactory level of inspection, test, and repair. Similarly, for engines/power plants the service life should normally be a minimum of 10 000 hours and where, due to their modular construction the interconnection system or parts thereof are required to have greater service lives the system design should permit satisfactory inspection, test and repair.

## 7 Smoke and fire hazards

Components of the interconnection system defined in this code of practice have been designed with an awareness of the hazards of smoke and toxic products under failure conditions. There are no nationally or internationally agreed methods of test and assessment for these hazards and it has been, and remains, the responsibility of the designers to avoid the use of materials which, in any likely condition of use or abuse could create a known abnormally severe failure condition. The design of installations should recognize the need to provide adequate mechanical protection of cables and included in this code of practice is reference to electrical and mechanical protection systems which should be followed to define the design standard. Flammability requirements have been specified for all the products mentioned in this code of practice and it should be noted that these requirements are intended to minimize, for example, the transmission of fire along cables or the propagation of fire by the release of flaming droplets. Nevertheless the installation of cables should, as far as is practicable, recognize that severe overheat of cables is a possibility, especially at terminations, and the size of cable looms (bundles) and their disposition should be determined with this factor in mind. Where an area of significant risk occurs, such as in bus bar distribution panels within the flight deck or cockpit, then ready access for hand held fire extinguishers should be provided. These should be appropriately identified by the use of a placard.

Due to potential fire hazard, silver plated conductors should not be used in areas where they are subject to contamination by ethylene glycol solutions.

## 8 Electrical protection

The cables should be protected from overload by circuit breakers or fuses. The purpose of the circuit protection is to protect the interconnection system rather than the equipment, which should be separately protected if required. The rating of the circuit breaker or fuse should be selected to protect the lowest rated component of the interconnection system. The circuit breaker should be of the 'trip free' type so that no override facility exists such