



Manual of Standards Part 171 — Aeronautical Telecommunication and Radio Navigation Services

as amended

made under subsection 9 (1) of the *Civil Aviation Act 1988* and
regulation 171.017 of the *Civil Aviation Safety Regulations 1998*

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Chapter 1 Introduction

Section 1.1 General

1.1.1 Background

- 1.1.1.1 The standards pertaining to the regulation of Aeronautical Telecommunication and Radio Navigation service providers in this Manual are established by the Civil Aviation Safety Regulations Part 171 — Approved Aeronautical Telecommunication and Radionavigation Service Providers. Part 171 has its basis in the Standards and Recommended Practices in Annex 10 to the Convention on International Civil Aviation.

1.1.2 Document set

- 1.1.2.1 The document hierarchy consists of:
- relevant Civil Aviation Safety Regulations (CASRs);
 - the Manual of Standards (MOS); and
 - Advisory Circulars (ACs).
- 1.1.2.2 The regulatory documents establish, for service providers, a comprehensive description of system requirements and the means of meeting them.
- 1.1.2.3 **CASRs** establish the regulatory framework (*Regulations*) within which all service providers must operate.
- 1.1.2.4 The **MOS** comprises specifications (Standards) prescribed by CASA, of uniform application, determined to be necessary for the safety of air navigation. In those parts of the MOS where it is necessary to establish the context of standards to assist in their comprehension, the sense of parent regulations has been reiterated. The MOS is a disallowable instrument. This means that it is a legislative instrument that becomes effective on publication in the Government Gazette and it must be tabled in Parliament within fifteen sitting days from when it was made and is subject to scrutiny by Parliament.
- 1.1.2.5 Readers should understand that in the circumstance of any perceived disparity of meaning between MOS and CASRs, primacy of intent rest with the CASR. Where there is any inconsistency between the regulations and the MOS, the regulations prevail.
- 1.1.2.6 Service providers must document internal actions (*Rules*) in their own Operational Manuals, to ensure compliance with the standards.
- 1.1.2.7 **ACs** provide recommendations and guidance material to illustrate a means, but not necessarily the only means, of complying with the Regulations. ACs may explain certain regulatory requirements by providing interpretive and explanatory material. It is expected that service providers will document internal actions in their own Operational Manuals, to put into effect those, or similarly adequate, practices.

1.1.3 Differences between ICAO standards and those in MOS

- 1.1.3.1 Notwithstanding the above, where there is a difference between a standard prescribed in ICAO Annexes and the Manual of Standards (MOS), the MOS standard shall prevail.

1.1.4 Differences published in AIP

- 1.1.4.1 Australian differences to the ICAO Standards and Recommended Practices are published in AIP GEN 1.7.

1.1.5 MOS documentation change management

- 1.1.5.1 Responsibility for the approval of the publication and amendment of the Manual of Standards (MOS) resides with the Branch Head, Airspace, Air Traffic and Aerodrome Standards Branch, of the Aviation Safety Standards Division, Civil Aviation Safety Authority.
- 1.1.5.2 This document is issued and amended under the authority of the Branch Head, Airspace, Air Traffic and Aerodrome Standards Branch.
- 1.1.5.3 Requests for **any change** to the content of the MOS may be initiated by:
- technical specialist areas within CASA;
 - Aeronautical Telecommunication and Radio Navigation service providers;
 - ATS service providers.
- 1.1.5.4 The need to **change standards** in the MOS may be generated by a number of causes. These may be to:
- ensure safety;
 - ensure standardisation;
 - respond to changed CASA standards;
 - respond to amendments to the ICAO Annexes;
 - accommodate new initiatives or technologies.

1.1.6 Related documents

- 1.1.6.1 These standards should be read in conjunction with ICAO Annex 10 Volumes I to V inclusive, and ICAO Doc 8071 Volume I — Testing of Ground-Based Radio Navigation Systems.

Section 1.2 Definitions

Definition	Meaning
Aeronautical telecommunication service	An aeronautical broadcast service, or an aeronautical fixed service, or an aeronautical mobile service that supports an ATS, or any system that processes or displays air traffic control data.
Aeronautical radio navigation service	A radio navigation service intended for the benefit and for the safe operation of aircraft.
ATS	Air Traffic Service as defined in Annex 11 to the Convention on International Civil Aviation.
ATS provider	A person or organisation approved as an ATS provider under CASR Part 172.
Facility	One or more items of equipment, at one or more locations, that provide an aeronautical telecommunication or radio navigation service.
Safety Management System (SMS)	A system that defines the policies, procedures and practices for managing: (a) the safe provision of services; and (b) any changes to the provision of those services.
Safety case	A document that provides evidence and argument that a service or facility, or a proposed change to the design of a service or facility, meets safety objectives or levels for the service or facility.
Support service	A service, provided to a service provider, that: (a) is necessary for the functioning of a telecommunication or radionavigation service; and (b) consists of information in electronic form and the carrier that carries the information.

Chapter 2 Aeronautical telecommunication and radio navigation services and facilities

CASR reference: CASR Part 171.020 (2) (d) — List of aeronautical telecommunication and radio-navigation services

Section 2.1 Aeronautical telecommunication services

2.1.1 Classification of services

2.1.1.1 Aeronautical telecommunication services are the ground-based stations of those services defined hereunder supporting an Air Traffic Service provided under Part 172. Airborne stations are not included.

- (a) Aeronautical Broadcasting Service. A broadcasting service intended for the transmission of information relating to air navigation.

Note AWIB stations are not included.

- (b) Aeronautical Fixed Service. A telecommunication service between specified fixed points provided primarily for the safety of air navigation and for the regular, efficient and economical operation of air services.

- (c) Aeronautical Fixed Telecommunication Network Service. A worldwide system of aeronautical fixed circuits provided, as part of the aeronautical fixed service, for the exchange of messages and/or digital data between aeronautical fixed stations having the same or compatible communication characteristics.

- (d) Aeronautical Telecommunication Network Service. An inter-network that allows ground, air-ground and avionics data sub-networks to inter-operate by adopting common interface services and protocols based on the International Organisation for Standardization (ISO) Open Systems Interconnect (OSI) reference model.

- (e) Aeronautical Mobile Service. A mobile service between aeronautical ground stations and aircraft stations, in which survival craft stations may participate; emergency position-indicating radio-beacon stations may also participate in this service on distress and emergency frequencies. This service does not include ground stations that are provided for other than ATS purposes.

Note UNICOM, Certified Air/Ground Radio Services (CAGRS), Pilot Activated Lighting (PAL) and Aerodrome Frequency Response Unit (AFRU) stations are not included.

- (f) Any telecommunication service which processes or displays air traffic control data (including aviation meteorological data) for use by an ATS provider under Part 172.
- (g) Electronic briefing and flight plan lodgement service for the use of pilots.

Section 2.2 Aeronautical radio navigation services

2.2.1 Classification of services

2.2.1.1 A radio navigation service intended for the benefit, and for the safe operation of aircraft.

- 2.2.1.1 Radio navigation services include radio determination (radar surveillance services) supporting ATS.

Section 2.3 Aeronautical telecommunication and radio navigation facilities

2.3.1 Classification of facilities

- 2.3.1.1 The following list classifies the kinds of facilities used for the provision of aeronautical telecommunication and radio navigation services:
- (a) VHF air/ground voice communication facilities;
 - (b) HF air/ground voice communication facilities;
 - (c) UHF air/ground voice communication facilities;
 - (d) Precision approach radio navigation aids;
 - (e) Instrument Landing System facilities;
 - (f) Non-precision radio navigation aids;
 - (g) Distance Measuring Equipment;
 - (h) VHF Omni-range (VOR) facilities;
 - (i) Non-directional beacons (NDB);
 - (j) Flight data processing facilities;
 - (k) Flight information facilities;
 - (l) Radar data processing facilities;
 - (m) Primary surveillance radar facilities;
 - (n) Secondary surveillance radar facilities;
 - (o) Surface movement radar facilities;
 - (p) Precision runway monitor facilities;
 - (q) Automatic dependent surveillance system facilities;
 - (r) Voice switching and control facilities;
 - (s) ATS point to point communication facilities;
 - (t) Air/ground data links;
 - (u) Ground to ground data interchange networks;
 - (v) Human Machine Interface systems, including Tower Consoles, ATS Work Stations, and Display facilities;
 - (w) Uninterruptable and emergency power supplies;
 - (x) Essential services in buildings and in equipment shelters housing facilities (electrical power supplies, air-conditioning, and security facilities);
 - (y) Global Navigation Satellite System ground based augmentation stations or facilities;
 - (z) Aeronautical databases used in or by a facility;

- (aa) Meteorological Display Systems used for ATS;
- (bb) Voice and Data Recording facilities;
- (cc) Any other facilities supporting ATS provided under Part 172.

Chapter 3 Safety management system

CASR reference: CASR 171.086 Safety management system

Section 3.1 Standards for the safety management system

3.1.1 Necessary features of Safety Management System

3.1.1.1 The necessary features of an SMS are:

- (a) the service provider's safety policy and objectives; and
- (b) the organisational and staff responsibilities for safety matters; and
- (c) the establishment of the levels of safety that apply to the services, and the monitoring of the levels of safety achieved; and
- (d) the process for internal safety reviews; and
- (e) the process for the internal reporting and management of safety concerns and incidents; and
- (f) the process for the identification, assessment, control and mitigation of existing and potential safety hazards in service provision; and
- (g) the definition of the interface arrangements for safety management and the relative associated responsibilities and procedures with internal functional groups and with aerodrome operators and support service providers; and
- (h) the processes for the management of changes to existing services.

Section 3.2 Standards for safety case preparation

3.2.1 Standards

3.2.1.1 Safety cases are to be based on a recognised methodology for safety risk assessment.

3.2.1.2 The safety risk assessment in a safety case:

- (a) identifies all potential safety hazards associated with the operation of each service, in normal and abnormal modes of operation;
- (b) assesses the safety risk of each hazard;
- (c) identifies the means of mitigation of unacceptable safety risks.

Note Guidelines for the preparation of safety cases have been published by CASA in Advisory Circular AC 171-02.

3.2.1.3 Existing ATEL/ANAV services and/or facilities having a demonstrated history of safe operation for more than two years at the date of initial certification do not need to be covered by a baseline safety case.

3.2.1.4 A safety case is prepared to support a proposed new service, or a proposed change to an existing service, if:

- (a) the effect of the service or change would be that the service would not be in accordance with the certificate issued to the service provider under regulation 171.250 of CASR; or
- (b) the new service or proposed change requires prior notification to CASA because of a requirement to do so in the service provider's safety management system.

Note Internal safety assessments for changes in accordance with regulation 171.040 of CASR are undertaken in accordance with the service provider's safety management system.

Chapter 5 Technician qualifications, training and certification

CASR reference: CASR Part 171.050

Section 5.1 Technician qualifications

5.1.1 Minimum academic qualifications

- 5.1.1.1 The minimum academic qualification for technicians performing operation and maintenance functions associated with aeronautical telecommunication facilities and/or radionavigation facilities is a diploma of technology in one of the following:
- (a) radio engineering;
 - (b) communications engineering;
 - (c) electrical engineering;
 - (d) electronic engineering;
 - (e) computer science;
 - (f) information technology; or
 - (g) qualifications equivalent to the above qualifications.
- 5.1.1.2 For those technicians that carry out or supervise electrical and mechanical trades work only, the minimum qualification is an electrical or mechanical trades qualification, as relevant.
- 5.1.1.3 Where an organisation considers, and CASA agrees, that the operation and maintenance of a particular type of facility is not technically complex, lesser qualifications may be acceptable for those technicians who operate and maintain that type of facility.

Section 5.2 Technician training and certification

5.2.1 Authorising certificate

- 5.2.1.1 Approved organisations provide technicians with an authorising certificate which:
- (a) establishes the identity of the technician;
 - (b) details the scope of the authorisation granted to the technician by listing the facilities, or types of facilities, which the technician is authorised to operate and/or maintain; and
 - (c) includes a date of effect, and the period of time for which each of the authorisations remain current.
- 5.2.1.2 An organisation must not grant a technician an authorising certificate in respect to a particular facility or a class of facility unless it has established that the technician:
- (a) has undergone a competency based course of instruction or on-the-job training specific to that facility or that class of facility; and

- (b) has been assessed to be competent in the operation and maintenance of the facility or the class of facility by an assessor who:
 - (i) has been trained and accredited in the Assessment Units of Certificate IV in Assessment and Workplace Training as developed under the auspices of the Australian National Training Authority; and
 - (ii) holds formal recognition of competency in the unit being assessed, at or above the level being assessed; and has current knowledge of the workplace and job/role of the person being assessed.
- (c) However, if an assessor does not have all the competencies at (b) (i) and (b) (ii), one person with the competencies in (b) (i) and one or more persons with the competencies in (b) (ii) may work together to conduct assessments.

5.2.2 Refresher training and recency checking procedure

- 5.2.2.1 Approved organisations must also have a process for refresher training and recency checking of technicians to ensure the on-going retention of technician's competency on the facility types for which an authorising certificate has been granted.

Chapter 6 Test equipment and test facilities

CASR reference: CASR Part 171.070

Section 6.1 Test facilities for aeronautical telecommunication or radio navigation services and facilities

6.1.1 Standards

- 6.1.1.1 An organisation has available the necessary test facilities for use in the operation and maintenance of services and facilities.
- 6.1.1.2 Organisations use documented procedures to control, calibrate, and maintain test equipment.
- 6.1.1.3 Calibrated test equipment is used in maintenance of a service or facility.
- 6.1.1.4 Calibration is carried out at prescribed intervals for each type of test equipment and the calibration is traceable to national measurement standards.
- 6.1.1.5 Records of the calibration status of each item of test equipment are retained.
- 6.1.1.6 Each item of test equipment carries a visual identification of its calibration status, the date that the equipment was last calibrated, and the prescribed calibration periodicity.
- 6.1.1.7 An organisation is to assess the validity of previous test results whenever an item of test equipment is found to be out of calibration.

Chapter 7 Document data availability and control

CASR reference: CASR Part 171.075

Section 7.1 Documents to be held by the provider

7.1.1 Standards

- 7.1.1.1 Documentation that is essential for the provision of services under the certificate are:
- (a) Annex 10 Volumes I to V inclusive, and Annex 11;
 - (b) the functional specification and technical specification of services and facilities;
 - (c) records of the configuration of facilities;
 - (d) facility operation and maintenance plans;
 - (e) interface agreements with other organisations;
 - (f) facility technical manuals or instructions;
 - (g) local instructions and technical procedures; and
 - (h) safety cases.

Section 7.2 Document and data control processes

7.2.1 Standards

- 7.2.1.1 Document and data control processes are those which control the authorisation, publication, distribution, and amendment, of all documentation issued, or required, by the organisation.
- 7.2.1.2 These processes are to ensure that:
- (a) documents are authorised by a designated authority;
 - (b) the currency of documentation can be readily determined;
 - (c) documents are available at locations where needed by staff;
 - (d) only current versions of documents are available; and
 - (e) a master copy of all documentation is securely held.
- 7.2.1.3 All documents that are related to and referenced in the Operations Manual are to be indexed in the Operations Manual.

Chapter 8 Records

CASR reference: CASR Part 171.080

Section 8.1 Records system and procedures

8.1.1 General

- 8.1.1.1 The records system and procedures identify, collect, index, store, and maintain records necessary for the safe provision of services.

8.1.2 Standards

- 8.1.2.1 The procedures must ensure that legible and permanent records are kept which provide a traceable history over the lifecycle of services. Records kept include:
- (a) records of design, manufacturing, procurement, installation, testing, commissioning, modification, and decommissioning;
 - (b) records of the designated authorities for the design, operation and maintenance for each system;
 - (c) records of hazard analysis and risk assessments;
 - (d) records of facility performance and facility maintenance history including performance parameter values, test facilities utilised, identity of authorised technicians conducting operation and maintenance, changes to maintenance procedures;
 - (e) records of facility failures and faults
 - (f) records of defect reports and associated defect investigations;
 - (g) records of technician's competencies, including details of experience, qualifications, training, competency assessments, and facility authorisations.

Section 8.2 Site logs

8.2.1 Standards for site logs

- 8.2.1.1 Site logs are kept for all facilities used to provide an aeronautical telecommunication service or a radionavigation service.
- 8.2.1.2 The site log records all occurrences and actions relating to operation, maintenance, modification, failure, faults, and removal from and restoration to service.
- 8.2.1.3 Entries in site logs include the date/time of the entry and the occurrence and are signed by the technician or other person making the entry.
- 8.2.1.4 Site log records are retained for at least five years.

Chapter 9 Security

CASR reference: CASR Part 171.085

Section 9.1 Security program for aeronautical telecommunication and radio navigation facilities

9.1.1 Purpose

- 9.1.1.1 The purpose of a security program is to minimise the risk of unauthorised access, entry by animals, or malicious damage to a service or facilities.

9.1.2 Standards

- 9.1.2.1 The security program includes the physical security measures, and the procedures to be followed, for:
- (a) preventing and detecting intentional or unintentional damage to any facility or equipment used for providing an aeronautical telecommunication or radionavigation service;
 - (b) responding to a threat of intentional damage to a facility or equipment;
 - (c) preventing unauthorised people from having access to any facility or equipment used by the provider in providing an aeronautical telecommunication or radionavigation service.

Notes to Manual of Standards Part 171

Note 1

The Manual of Standards Part 171 (in force under the *Civil Aviation Safety Regulations 1998*) as shown in this compilation comprises Manual of Standards Part 171 amended as indicated in the Tables below.

Table of Orders

Year and number	Date of notification in <i>Gazette</i> / registration on FRLI	Date of commencement	Application, saving or transitional provisions
MOS 171	—	1 May 2003	
MOS 171 2006 No. 1	FRLI 15 August 2006 (see F2006L02666)	16 August 2006 (see s. 2)	

Table of Amendments

ad. = added or inserted am. = amended rep. = repealed rs. = repealed and substituted

Provision affected	How affected
s. 1.2	am. MOS 171 2006 No. 1
Chapter 3 (after heading)	ad. MOS 171 2006 No. 1
s. 3.1	am. MOS 171 2006 No. 1
s. 3.2	am. MOS 171 2006 No. 1
Chapter 4	rep. MOS 171 2006 No. 1