

MANUAL OF STANDARDS (171 – AERONAUTICAL TELECOMMUNICATIONS) 2024

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In exercise of the powers conferred by paragraph 5(2) of the Civil Aviation Authority of Singapore (Air Navigation Services) Directions 2010 (Ministerial Direction No. 1/2010), the Civil Aviation Authority of Singapore (“the Authority”) issues the following Manual of Standards.

PART 1

PRELIMINARY

Citation and commencement

1. This Manual is the Manual of Standards (171 – Aeronautical Telecommunications) 2024 and come into operation on 15 April 2024.

Definitions

2. In this Manual, unless the context otherwise requires, any term defined in the First Schedule has the meaning given to that term in that Schedule.

Application of this Manual

3. This Manual applies to the provider of air navigation services within the Singapore Flight Information Region and such other area as the Minister for Transport may authorise (called in this Manual the Air Navigation Services Provider or “ANSP”) in its provision of aeronautical telecommunications.

PART 2

Division 1 – General

Provision of aeronautical telecommunications

4. The ANSP must establish a service for the provision of aeronautical telecommunications for the safety, regularity and efficiency of air navigation.

Aeronautical telecommunications operations manual

5.— (1) The ANSP must establish and maintain an operations manual for its provision of aeronautical telecommunications for air navigation.

(2) The aeronautical telecommunications operations manual established for the purposes of sub-paragraph (1) must include the following:

(a) a statement by the ANSP confirming that —

- (i) the operations manual accurately describes the ANSP’s organisation structure and the operating procedures that the ANSP’s personnel are required to comply with at all times;
- (ii) its provision of aeronautical telecommunications is in accordance with the relevant standards in Annex 10 to the Chicago Convention;

- (iii) the units of measurement specified in Annex 5 to the Chicago Convention are used in its provision of aeronautical telecommunications; and
 - (iv) the operations manual demonstrates the means and methods of the ANSP's organisation for ensuring continuous compliance with this Manual and the applicable requirements in Part II of the Ministerial Direction No. 1/2010.
- (b) the name of and the post held by the key personnel who is appointed under paragraph 5 of the Manual of Standards (170 – Air Navigation Services Provider) 2024 to be responsible to the key personnel appointed under paragraph 4 of the Manual of Standards (170 – Air Navigation Services Provider) 2024 for the provision of aeronautical telecommunications and his or her duties and responsibilities;
 - (c) an organisation chart showing the lines of responsibility of the personnel employed or engaged in its provision of aeronautical telecommunication services;
 - (d) a job description for each of the personnel who is responsible for carrying out the ANSP's provision of aeronautical telecommunications, which must include the job function, responsibilities and outcome to be achieved by each personnel;
 - (e) a list of each type of aeronautical facility to be operated for the provision of aeronautical telecommunications;
 - (f) the procedures or processes required to ensure that every aeronautical facility utilised by the ANSP in its provision of aeronautical telecommunications is operated in accordance with the operations and maintenance plan specified in paragraph 11;
 - (g) the procedures for establishing and maintaining an Air Traffic Safety Electronic Personnel ("ATSEP") programme under paragraph 26;
 - (h) the procedures for applying human factors principles in the design, operations and maintenance of each aeronautical facility;
 - (i) the procedures to control, amend and distribute the operations manual, including the distribution of the initial copy and all subsequent amendments made to the operations manual;
 - (j) the procedures or processes required under this Manual that must be included in the operations manual; and
 - (k) the procedures necessary to ensure its compliance with —
 - (i) this Manual; and
 - (ii) the Manual of Standards (170 — Air Navigation Services Provider) 2024.

(3) The ANSP must ensure that it provides aeronautical telecommunications in accordance with the operations manual established under sub-paragraph (2).

(4) The ANSP must update, amend or add to the operations manual as the ANS Regulator may require for ensuring —

- (a) the accuracy of the operations manual; and
- (b) the safety, efficiency or regularity of air navigation.

Control of data and documentation

6.— (1) The ANSP must take all reasonably practicable measures to ensure the accuracy of all data and documentation necessary for the provision of aeronautical telecommunications, and the operations and maintenance of its aeronautical facilities.

(2) Data and documentation include the operations manual, system manuals, operations and maintenance (“O&M”) plans, maintenance operation management plan, schedules, checklists, flight check requirements, technical standards, practices, procedures, personnel records, ATSEP programme, maintenance records, and system failure reports.

- (3) The ANSP must develop and apply appropriate policies and procedures to ensure —
- (a) the proper collection, storage, processing and dissemination of data and documentation;
 - (b) the timely review and updating of all data and documentation;
 - (c) that amendments to the data and documentation are approved by an appropriate person before issue, and the reasons for the amendment are documented;
 - (d) that any amendment to the operations manual and O&M plans are notified to the ANS Regulator in a timely manner;
 - (e) that up-to-date versions of all relevant data and documents are accessible to the ANSP’s personnel at all locations if required for the provision and operation of aeronautical facilities;
 - (f) that the current version of each data and document are identifiable such that the use of obsolete material is precluded; and
 - (g) that all obsolete data and documentation are clearly marked and promptly removed from circulation.

Control of records

7. The ANSP must develop and apply appropriate policies and procedures on retention of records relating to the provision of aeronautical telecommunications, including the records specified in the Second Schedule.

Division 2 — Commissioning, temporary removal and decommissioning of an aeronautical telecommunication facility

Commissioning of aeronautical facility

8.— (1) The ANSP must take all reasonably practicable measures to ensure that each aeronautical facility is designed, installed and commissioned to meet the applicable operational specifications for the facility.

(2) The ANSP must develop and apply appropriate procedures for commissioning an aeronautical facility for operational use in any of the following circumstances (called in this Manual commissioning procedures) —

- (a) implementation and operationalisation of a new aeronautical facility;
 - (b) relocation of an existing aeronautical facility;
 - (c) modification of an existing aeronautical facility leading to changes in the provision of aeronautical telecommunications;
 - (d) restoration to service of an aeronautical facility that was removed from service temporarily.
- (3) The procedures established under sub-paragraph (2) must ensure that —
- (a) each aeronautical facility meets the operational specifications applicable to that facility;

- (b) each aeronautical facility complies with this Manual, system characteristics and specification standards prescribed in Annex 10 (Volumes I, II, III, IV and V) to the Chicago Convention, the Procedures for Air Navigation Services (“PANS”), and other applicable documents issued by the International Civil Aviation Organisation;
- (c) human factors principles are appropriately applied in the design, operations and maintenance of the facility;
- (d) the system performance of the facility is properly verified and accepted by the ANSP, the persons using the facility for operations and the relevant maintenance contractors; and
- (e) a risk assessment or a safety case (as the case may be) is conducted in accordance with paragraph 8 of the Manual of Standards (170 — Air Navigation Services Provider) 2024.

(4) The ANSP must not use any aeronautical facility to provide an aeronautical telecommunication service unless the commissioning procedures established under sub-paragraph (2) are applied to that facility.

Temporary removal of aeronautical facility from service

9.— (1) The ANSP must take all reasonably practicable measures and develop and apply appropriate procedures to ensure that the temporary removal from service of an aeronautical facility is performed safely.

(2) The procedures established under sub-paragraph (1) must include —

- (a) an identification of the risks arising from the disruption to the facility’s interfaces (for example, with stakeholders, software or hardware) and verification that measures have been taken to mitigate such risks; and
- (b) an identification and implementation of maintenance procedures that need to be carried out while the facility is not in use.

Decommissioning of aeronautical facility

10.— (1) The ANSP must take all reasonably practicable measures and develop and apply appropriate procedures to ensure that the permanent decommissioning and removal from service of an aeronautical facility is performed safely.

(2) The procedures established under sub-paragraph (1) must include the identification and mitigation of the risks arising from the disruption to the facility’s interfaces (for example, with stakeholders, software or hardware) and verification that measures have been taken to mitigate such risks.

Division 3 — Operations and maintenance of aeronautical facilities

Operations and maintenance plan

11.— (1) The ANSP must establish, implement and maintain an operations and maintenance plan for each aeronautical facility.

(2) The operations and maintenance plan established under sub-paragraph (1) must —

- (a) describe the following matters regarding each facility —
 - (i) the role of the aeronautical facility in the provision of air navigation services;

- (ii) date of commissioning;
 - (iii) power supply configuration;
 - (iv) current system design architecture;
 - (v) location of the facility;
 - (vi) list of software in use and its associated system;
 - (vii) list of standards which the facility is compliant with;
 - (viii) list of interfaces with other systems;
 - (ix) list of completed safety assessments associated with the facility;
 - (x) list of safety performance indicators, if applicable; and
 - (xi) list of services that support the operations and maintenance of the facility.
- (b) describe the following matters regarding the parties involved in the operations and maintenance of the facility —
- (i) the roles and responsibilities of these parties;
 - (ii) job descriptions for its ATSEP which must contain the job function, key responsibilities, and outcomes to be achieved by the ATSEP; and
 - (iii) analysis of the number of the ATSEPs required to operate and maintain the facility taking into account the workload required;
- (c) specify the procedures to ensure the reliability and availability of each facility, including —
- (i) the preventive and corrective maintenance plans, and where the repair of modules and components are undertaken;
 - (ii) the periodic inspection, testing of the facility, and flight tests, if applicable, to verify that the facility meets the operational and performance specifications;
 - (iii) the intervals between various types of inspections and testing, and the basis for those intervals;
 - (iv) the interval between each flight test and its basis for such an interval, if applicable;
 - (v) the operations and maintenance instructions;
 - (vi) the timely and appropriate detection, warning and rectification of failures and degradations, of each facility and its monitoring systems;
 - (vii) the measures to control the probability of failures and degradations to as low as reasonably practicable, which may include, but are not limited to, analysis of trends;
 - (viii) the contingency plans in the event of facility failure or degradation, including backup facilities or procedures;
 - (ix) the documentation of the actions to be performed to address facility failures and degradations, and the outcomes of unresolved failures and degradations;
 - (x) the arrangements to provide a safe and conducive environment for the operation and maintenance of the facility, including fire prevention, optimal temperature and humidity, pest control, grass cutting, lightning protection, decluttering;

- (xi) the recording of all actions that were performed on each facility, such as those related to maintenance, failure, degradation, modification, removal and restoration of aeronautical telecommunication services;
 - (xii) the facility support plan for the life cycle of each facility, which may include spares support, spares management and provision of technical support; and
 - (xiii) the management of obsolete hardware and software.
- (d) specify the procedures to verify that the facility continues to meet the applicable Standards and Recommended Practices in Annex 10 to the Chicago Convention for such time as the facility is used to provide an aeronautical telecommunication service.

Arrangements to provide or support aeronautical telecommunication services

12.— (1) The ANSP must enter into a written service agreement with every service provider or contractor who provides or supports its provision of aeronautical telecommunications.

(2) The ANSP must develop and apply appropriate procedures on the making of a service agreement mentioned in sub-paragraph (1) to ensure that any service agreement made with a service provider or contractor includes the following —

- (a) the functional specifications of the service to be provided by the service provider or contractor;
- (b) the service level or standards that must be met by the service provider or contractor to ensure reliability (including accuracy and integrity), availability and maintainability (including deadline for recovery from service failure), where relevant;
- (c) monitoring and reporting of the operational status of the service to the ANSP; and
- (d) the conduct of audits and inspections by the ANSP for the purpose of evaluating the performance of the service provider or contractor, including the performance of the service provider or contractor with respect to sub-paragraphs (a) to (c).

Power supply

13. The ANSP must develop and apply appropriate procedures to ensure that each aeronautical facility is provided with suitable power supply to ensure continuity of service consistent with the use of the service involved.

Inspection, measuring and test equipment

14.— (1) The ANSP must ensure that appropriate inspection, measuring and testing equipment are used for testing and maintenance of every aeronautical facility.

(2) The ANSP must ensure that —

- (a) there is adequate availability of inspection, measuring and testing equipment;
- (b) every inspection, measuring and testing equipment for each facility —
 - (i) meets the requisite standards for precision and accuracy;
 - (ii) is calibrated before use;
 - (iii) is identified with a suitable indicator to show its calibration status;
 - (iv) is calibrated in accordance with the appropriate standards specified for that equipment;

- (v) is readily available for personnel to carry out their duties and functions; and
 - (vi) is properly handled, preserved and stored.
- (c) procedures are established to control, calibrate and maintain all the inspection, measuring and testing equipment required under sub-paragraphs (b)(i) to (vi).

Flight inspection of radio navigation aids

15.— (1) The ANSP must develop and apply appropriate procedures on the conduct of periodic flight inspections for radio navigation aids in accordance with Standard 2.2 of Annex 10 Volume 1 of the Chicago Convention and ICAO Doc 8071 Volume I.

(2) Where the ANSP determines from a flight inspection that the operational status of a radio navigation aid is restricted, the ANSP must —

- (a) take immediate actions to address and mitigate any safety risks in the use of that radio navigation aid;
- (b) take measures to fully restore the operational status of the navigation aid; and
- (c) inform the ANS Regulator of the operational status of that radio navigation aid.

(3) Where the ANSP determines from a flight inspection that the operational status of a radio navigation aid is unusable, the ANSP must —

- (a) take immediate actions to cease the use of the radio navigation aids; and
- (b) inform the ANS Regulator of the operational status of that radio navigation aid.

Predetermined distribution system for aeronautical fixed telecommunication network messages

16. The ANSP must develop and apply appropriate procedures for sending its list of selected predetermined distribution addressee indicators for its aeronautical fixed telecommunication network (“AFTN”), together with the associated lists of addressee indicators to —

- (a) the States from which the ANSP will receive AFTN messages for predetermined distribution, to assure correct routing; and
- (b) the States which will originate AFTN messages for predetermined distribution to facilitate the treatment of requests for retransmission and to assist originators in using the predetermined distribution addressee indicators correctly.

Information on the operational status of radio navigation services

17. The ANSP must take all reasonably practicable measures and develop and apply appropriate procedures to ensure that air traffic services units are provided with timely information on the operational status of each radio navigation service that is essential for the approach, landing and take-off at the aerodrome for which it provides air traffic services.

Provision of information to aeronautical information services

18.— (1) The ANSP must ensure that the following information is provided to the provider of aeronautical information services —

- (a) operational information relating to any new facility or changes to an existing facility; and
- (b) information of any change in the operational status of an existing facility.

(2) The ANSP must develop and apply appropriate procedures for the provision of the information mentioned in sub-paragraph (1), including verifying that the information provided under sub-paragraphs (1)(a) and (b) have been accurately published in the appropriate aeronautical information products.

(3) The ANSP must incorporate in the procedures mentioned in sub-paragraph (2), the aeronautical data quality requirements for data accuracy, data resolution, data integrity, data traceability, data timeliness, data completeness and data format as specified in Chapter 3 Standard 3.2 of Annex 15 to the Chicago Convention.

Notification of aeronautical telecommunication facility status

19. The ANSP must take all reasonably practicable measures and develop and apply appropriate procedures —

- (a) to notify other providers of air navigation services of the normal hours of service of the ANSP's aeronautical telecommunications stations and offices;
- (b) to notify other providers of air navigation services, whenever necessary and practicable, of any change in the normal hours of service of the ANSP's aeronautical telecommunications stations and offices, before such a change is effected;
- (c) to respond to a request for a change in the normal hours of service of the ANSP's aeronautical telecommunications stations and offices made by another provider of air navigation service; and
- (d) whenever necessary, to promulgate any change in the hours of service in NOTAM.

Division 4 — Management of radio frequencies

Managing aeronautical radio spectrum

20.— (1) The ANSP must take all reasonably practicable measures and develop and apply appropriate procedures to prevent any of its radio station or aeronautical facility to conflict or interfere with the aeronautical radio spectrum.

(2) The ANSP must maintain records of the frequencies allocated for its radio stations and facilities by the Government, department of the Government or statutory body responsible for frequency allocation and assignment.

Managing radio interference

21.— (1) The ANSP must take all reasonably practicable measures and develop and apply appropriate procedures to prevent wilful transmission of unnecessary or anonymous radio signals, messages or data by any of its radio stations.

(2) The ANSP must develop and apply appropriate procedures with the Government, department of the Government or statutory body responsible for frequency allocation and assignment to report and follow-up on any radio frequency interference affecting provision of aeronautical telecommunication services.

Division 5 – Management of occurrences

Managing occurrences

22.— (1) The ANSP must take all reasonably practicable measures and develop and apply appropriate procedures to respond to every occurrence, including measures to —

- (a) report the occurrence to the ANS Regulator;
- (b) notify relevant persons (including the system owner, maintenance contractors and the building services provider) of the occurrence;
- (c) determine the cause of the occurrence;
- (d) resolve the occurrence in an expeditious and effective manner;
- (e) implement measures to prevent recurrence of the occurrence, where necessary;
- (f) make and retain records and documents with respect to the above actions; and
- (g) periodically review every occurrence with relevant persons (including its maintenance contractors and building services provider) to —
 - (i) determine if the measures implemented to prevent recurrence of the occurrences are still in place and effective;
 - (ii) determine adverse trends; and
 - (iii) implement appropriate measures to improve the safety performance of the provision of aeronautical telecommunications.

Obligation to report reportable occurrences

23.— (1) The ANSP must report to the ANS Regulator any reportable occurrence specified in sub-paragraph (4) of which the ANSP has knowledge.

(2) The report must be made to the ANS Regulator through the most expeditious means available as soon as practicable within 24 hours of the occurrence.

(3) The ANSP must submit a formal written notification to the ANS Regulator within 72 hours of the occurrence.

(4) In this paragraph, “reportable occurrence” means —

- (a) a partial or total loss of aeronautical telecommunications;
- (b) an occurrence where a back-up mechanism was activated to continue the provision of aeronautical telecommunications;
- (c) an occurrence which poses a hazard to the provision of aeronautical telecommunications, including —
 - (i) structurally unsound facility;
 - (ii) electrical power supply failure;
 - (iii) fire-related occurrence, including fire suppression gas discharge;
 - (iv) radio frequency interference;
 - (v) security-related breach;
- (d) any other occurrence which the ANSP reasonably knows has a significant safety impact on the provision of aeronautical telecommunications.

Investigation of occurrences

24.— (1) The ANSP must conduct an investigation of —

- (a) a reportable occurrence specified in paragraph 23(4)(a) or (4)(b) that occurs on or after 15 April 2024; or
- (b) any other occurrence which the ANS Regulator requires to be investigated.

(2) The ANSP must develop and apply appropriate procedures for the conduct of an investigation that is required to be investigated under sub-paragraph (1).

(3) The investigation procedures mentioned in sub-paragraph (2) must require that all relevant records necessary to support the investigation report specified in sub-paragraph (5), are preserved for investigation purposes.

(4) The ANSP must submit to the ANS Regulator a report of each investigation required by sub-paragraph (1)(a) or (b), within six weeks after the date the reportable occurrence or other occurrence required to be investigated had occurred (or any longer period that the ANS Regulator may allow in any particular case).

(5) The investigation report must include —

- (a) a factual description of the occurrence, including relevant information and evidence;
- (b) the operational effect on the provision of air navigation services, and the ANSP's stakeholders;
- (c) an analysis of the occurrence, taking into account information from relevant stakeholders;
- (d) identification of causal factors, systemic issues and safety hazards;
- (e) a description of any non-adherence of the ANSP's policies and procedures, where applicable;
- (f) an assessment of the effectiveness of existing safety measures;
- (g) the corrective, preventive and safety actions taken; and
- (h) any other recommendations to enhance the ANSP's safety performance and the safety awareness of relevant stakeholders, or to address hazards (including with respect to training, procedures, systems and processes).

Division 6 — Personnel

Personnel requirements

25.— (1) The ANSP must directly employ, contract or otherwise engage personnel, including maintenance personnel, who are suitably qualified and competent for the provision of aeronautical telecommunications.

(2) The ANSP must not permit any person to perform any or all of the following functions or duties unless that person has been appointed as an ATSEP by the ANSP in accordance with paragraph 30 —

- (a) system, operational or functional checks, including associated parameter checks and system performance measurements;
- (b) system, component or software inspection, installation, repair, maintenance and modification;

- (c) scheduled and unscheduled maintenance tasks.

Air traffic safety electronics personnel programme

26.— (1) The ANSP must establish and maintain an ATSEP programme in accordance with the procedures established in its operations manual, which must include —

- (a) an ATSEP training programme in accordance with paragraphs 27 and 28;
- (b) a competency assessment methodology for the appointment of an ATSEP in accordance with paragraph 29; and
- (c) the procedures for the appointment of every ATSEP in accordance with paragraph 30, including procedures for managing the ATSEPs, the issuance of appointment documents to ATSEPs, and to ensure that only ATSEPs are permitted to perform any function or duty mentioned in paragraph 25(2).

(2) The ANSP must ensure that there is functional separation between the employees or officers of the Authority responsible for the appointment of ATSEPs under paragraph 30 and the employees or officers of the Authority involved in the planning, operations or maintenance of aeronautical telecommunication facilities and other operational departments of the ANSP.

(3) The ANSP must obtain the acceptance of the ANS Regulator for —

- (a) the ATSEP programme mentioned in sub-paragraph (1); and
- (b) any change to the ANSP’s ATSEP programme, before making that change.

Training of air traffic safety electronics personnel

27.— (1) The ANSP must establish and maintain an ATSEP training programme.

(2) The ATSEP training programme must —

- (a) be in accordance with the ICAO Manual on Air Traffic Safety Electronics Personnel Competency-based Training and Assessment (Doc 10057) and the ATSEP competency framework in the PANS-Training (Doc 9868) as adapted to suit the ANSP’s operating environment; and
- (b) provide for Level 1 (Basic), Level 2 (Qualification) and Level 3 (Specialised) training as follows —

Level 1 (Basic)	Training on all of the following: (a) international and national organizations and standards; (b) air traffic services, airspace standards, aeronautical information systems, meteorology and altimetry; (c) CNS/ATM concepts; and (d) human factors.
Level 2 (Qualification)	(a) Training in at least one of the following domains depending on the ATSEP’s job scope: (i) communications; (ii) navigation; (iii) surveillance; or (iv) ATM systems, include data processing and automation. (b) Training in each domain must be taken separately and not in combination with another domain.

Level 3 (Specialised)	Training on knowledge and skills relevant to a specific CNS/ATM system utilised in the ANSP's provision of aeronautical telecommunications and on-the-job training.
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Training plan

28.— (1) The ANSP must establish and maintain a plan for the training of each ATSEP.

(2) The training plan mentioned in sub-paragraph (1) must be reviewed at least once a year to —

- (a) identify any gaps in competency or changes in training requirements; and
- (b) prioritise the type of training required for the year.

Competency assessment of air traffic safety electronics personnel

29.— (1) The ANSP must develop and apply a methodology for the assessment of the competency of each ATSEP who performs a function or duty mentioned in paragraph 25(2).

(2) The method mentioned in sub-paragraph (1) must —

- (a) be based on the ATSEP competency framework in the PANS-Training (Doc 9868) and adapted to suit the ANSP's operating environment; and
- (b) include a process for continual competency assessment.

(3) The ANSP must ensure that the assessment of the competency of each ATSEP is conducted —

- (a) in accordance with the method mentioned in sub-paragraph (1); and
- (b) by a competency assessor selected by the ANSP who meets the criteria specified in sub-paragraph (4).

(4) The competency assessor selected by the ANSP must —

- (a) be an ATSEP for the specific CNS/ATM system; and
- (b) have received adequate training in the conduct of competency assessment, including practical checks and oral assessment.

(5) Where the ATSEP being assessed is working under the supervision of the competency assessor, the assessment must be conducted with another independent assessor.

Appointment of air traffic safety electronics personnel

30.— (1) The ANSP must not appoint any person as an ATSEP unless that person —

- (a) has completed the three levels of training mentioned in paragraph 27(2); and
- (b) is assessed to be competent using the assessment method specified in paragraph 29.

(2) The ANSP must ensure that every ATSEP appointed under this paragraph undergoes refresher training for Level 3 (Specialised) at least once every three years, and refresher training for Level 1 (Basic) and Level 2 (Qualification) as may be necessary.

FIRST SCHEDULE – DEFINITIONS

Paragraph 2

“Aeronautical facility” means the system (such as instrument landing system, surveillance radar system, VHF communications system), equipment and ancillary services and amenities, housed in a building or structure (such as an air traffic control tower), operated for the purpose of providing aeronautical telecommunications.

“Aeronautical fixed telecommunication network” or “AFTN” means a worldwide system of aeronautical fixed circuits provided, as part of the aeronautical fixed service, for the exchange of messages or digital data, or both messages and digital data, between aeronautical fixed stations having the same or compatible communications characteristics.

“Aeronautical information service” or “AIS” means a service established within the defined area of coverage responsible for the provision of aeronautical data and aeronautical information necessary for the safety, regularity and efficiency of air navigation.

“Aeronautical telecommunications” means a communication, navigation, surveillance or any air traffic management-related service established for the safety of air navigation.

“Air traffic management system” or “ATM system” means a system that provides ATM through the collaborative integration of humans, information, technology, facilities and services, supported by air and ground- and/or space-based communications, navigation and surveillance.

“Air traffic safety electronic personnel” or “ATSEP” means a person who is competent in the installation, operation or maintenance of a communication, navigation, surveillance or air traffic management system.

“Chicago Convention” means the Convention on International Civil Aviation concluded in Chicago on 7 December 1944 (as in force and amended from time to time).

“CNS” means communications, navigation and surveillance system.

“Human factors principles” means the principles which apply to aeronautical design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance.

“Maintenance contractor” means a person appointed by the ANSP to operate or maintain, or both operate and maintain, any facility of the ANSP on behalf of the ANSP.

“NOTAM” or “Notice to Airmen” means a notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations, and includes a SNOWTAM and an ASHTAM.

“Occurrence” means an occurrence that involves a hazard to the operations of an aeronautical telecommunication facility, with or without affecting the availability of the aeronautical telecommunication service, and includes the following —

- (a) malfunction or failure of a facility;
- (b) a power supply or network outage, flood, fire suppression gas discharge, fire or explosion at a facility;
- (c) error in the operations and maintenance in a facility which may have safety implications;
- (d) security breach at a facility which may have safety implications.

“Radio navigation service” means a service providing guidance information or position data for the efficient and safe operation of aircraft supported by one or more radio navigation aids.

SECOND SCHEDULE – RECORDS TO BE RETAINED

Paragraph 7

Records related to commissioning of aeronautical facilities

1. Verification that the facility complies with these Standards, applicable ICAO Annexes, PANS, and ICAO Documents, and the accepted results of the verification
2. Verification that human factors principles are appropriately applied in the design, operations and maintenance of the facility, and the accepted results of the verification
3. Validation of system performance of the facility, and the accepted results of the validation
4. Hazard logs and risk assessments
5. Results of applicable safety-related tests performed on the facility, i.e. validation of system performance of the new facility (e.g. Factory Acceptance Test, Site Acceptance Test, Reliability Acceptance Test)
6. Flight inspection reports
7. Calibration results of inspection, measuring and test equipment
8. System event logs
9. List of the allocated radio frequencies of its facilities

Records related to the operations and maintenance of aeronautical facilities

10. Internal audit reports
11. Hazard logs and risk assessments
12. Preventive maintenance activity logs
13. Corrective maintenance activity logs
14. Results of applicable safety-related tests performed on the facility, i.e. validation of system performance of the new facility (e.g. Factory Acceptance Test, Site Acceptance Test, Reliability Acceptance Test)
15. Flight inspection reports
16. Calibration results of inspection, measuring and test equipment
17. System event logs
18. Maintenance records
19. System failure reports
20. Occurrence reports
21. Investigation reports
22. Notes of meetings related to operations and maintenance of its facilities
23. List of the allocated radio frequencies of its facilities

Records related to the temporary removal of aeronautical facilities from service

24. Verification that any risk of disruption to the facility's interfaces are identified and mitigated

Records related to the decommissioning of aeronautical facilities

- 25. Verification that any risk of disruption to the facility's interfaces (e.g. stakeholder, software and hardware) are identified and mitigated.

Records related to every ATSEP

- 26. List of the current ATSEPs
- 27. Qualifications, training, and testing
- 28. Competency assessment completed
- 29. ATSEP approval received