

IMPLEMENTING STANDARD 11
Civil Aviation (Air Navigation Services) Regulations 2007 – Implementing Standards

TABLE OF CONTENTS

STANDARD	PAGE
11.1 Provision of Air Traffic Services <i>Regulation 16(1)(b)</i>	11-1
11.2 Facilities and Equipment <i>Regulation 18</i>	11-5
11.3 Training and Checking Program <i>Regulation 19</i>	11-9
11.4 Safety Management System <i>Regulation 20</i>	11-10
11.5 Contingency Planning <i>Regulation 23</i>	11-15
11.6 Security Program <i>Regulation 24(2)</i>	11-16
11.7 Aeronautical Telecommunications Systems <i>Regulation 26(1)(b)</i>	11-17
11. 8 Provision of Aviation Weather Services <i>Regulation 29</i>	11-24

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IMPLEMENTING STANDARD 11
Civil Aviation (Air Navigation Services) Regulations 2007

Standard No: - 11.1 PROVISION OF AIR TRAFFIC SERVICES
Regulation 16(1)(b)

(1) Air Traffic Control Service

(a) An air traffic control service is provided for the purpose of:

- i) preventing collisions between aircraft in the air;
- ii) assisting in preventing collisions between aircraft moving on the apron and the manoeuvring area;
- iii) assisting in preventing collisions between aircraft and obstructions on the manoeuvring area;
- iv) expediting and maintaining an orderly flow of air traffic.

(b) An air traffic control service is provided according to the particular circumstances and class of airspace. It may comprise one or more of the following:

- i) Aerodrome control service;
- ii) Approach control service, with or without the aid of radar;
- iii) Terminal control service, with or without the aid of radar
- iv) Area control service, with or without the aid of radar.

(2) Aerodrome Control

(a) An aerodrome control unit shall provide:

- i) Aerodrome control service.
- ii) Flight Information service.
- iii) Alerting service.

(b) An aerodrome control unit shall provide services principally to aircraft flying with visual reference to the surface in, and in the vicinity of, the aerodrome traffic zone and operating on the manoeuvring area. It shall normally a separate unit but may be combined, temporarily with the approach/terminal control unit.

(c) An aerodrome controller shall not provide approach/terminal radar control services whilst engaged on aerodrome control duties.

(d) Aerodrome control shall be responsible for issuing information and instructions to aircraft under its control to achieve a safe, orderly and expeditious flow of air traffic and to assist pilots in preventing collisions between:

- i) aircraft flying in, and in the vicinity of, the aerodrome traffic zone;

- ii) aircraft taking off and landing;
- iii) aircraft moving on the apron;
- iv) aircraft and vehicles, obstructions and other aircraft on the manoeuvring area.

(e) In order to execute his duties an aerodrome controller shall have authority over aircraft, vehicles and personnel on the manoeuvring area and aircraft moving on the apron.

(f) Aerodrome control may be divided into air control and ground movement control. Air Control shall provide services for i) and ii) and has absolute authority over all movements on active runways and their access points. Ground Movement Control shall provide services for iii) and iv) except on active runways and their access points.

(g) Aerodrome control also shall have the following specific responsibilities:

- i) Alerting the safety services;
- ii) Informing aircraft under its control of any depletion of the aerodrome emergency services;
- iii) Providing an approach control service when carrying out functions delegated by approach/terminal control;
- iv) Supplying the following information, according to unit instructions, to approach/terminal radar control:
 - A) Pertinent data on IFR, Special VFR and VFR traffic including departures, missed approaches and overdue aircraft;
 - B) Appropriate items of essential aerodrome information.
- v) Informing the aerodrome authority when it becomes apparent that there is a deterioration in the state of the aerodrome or associated facilities for which the aerodrome authority is responsible;
- vi) Initiating overdue action at aerodromes in coordination with the approach/terminal control unit.

(3) Aerodrome Control Rating

(a) An aerodrome control rating authorises the holder of the rating to provide, or supervise the provision of, such aerodrome control services, for such aerodromes, as are specified for endorsements also annotated on the licence.

(b) The holder of an aerodrome control rating must have demonstrated a level of knowledge in at least the following subjects to the extent that they affect the area of responsibility:

- (i) aerodrome layout; physical characteristics and visual aids;
- (ii) airspace structure;
- (iii) applicable rules, procedures and sources of information;
- (iv) air navigation facilities;
- (v) air traffic control equipment and its use;

- (vi) terrain and prominent landmarks;
- (vii) characteristics of air traffic;
- (viii) weather phenomena;
- (ix) emergency and search and rescue plans;

(4) Approach/Terminal Control

(a) An approach/terminal control unit shall provide:

- i) approach/terminal control service with or without the aid of radar;
- ii) flight information service;
- iii) alerting service.

(b) The approach/terminal control unit shall provide approach/terminal control services according to the classification of the airspace to the following:

- i) arriving aircraft released by an adjacent control until control is transferred to aerodrome control;
- ii) aircraft approaching from outside controlled airspace who place themselves under the control of the approach/terminal control until control is transferred to aerodrome control;
- iii) departing aircraft transferred by aerodrome control until they are transferred to an adjacent control unit.
- iv) over-flying aircraft .

(c) Approach control shall provide standard separation between Special VFR and IFR flights and between Special VFR flights unless the Director has approved a reduced separation.

(5) Approach/Terminal Control Rating

(a) An approach/terminal control rating authorises the holder of the rating to provide, or supervise the provision of, such approach control services, for such airspaces, as are specified for endorsements also annotated on the licence.

(b) The holder of an approach control rating must have demonstrated a level of knowledge in at least the following subjects to the extent that they affect the area of responsibility:

- (i) airspace structure;
- (ii) applicable rules, procedures and sources of information;
- (iii) air navigation facilities;
- (iv) air traffic control equipment and its use;
- (v) terrain and prominent landmarks;
- (vi) characteristics of air traffic and traffic flow;
- (vii) weather phenomena;
- (viii) emergency and search and rescue plans.

(6) Approach/Terminal Radar Control Rating

(a) An approach radar control rating authorises the holder of the rating to provide, or supervise the provision of, such radar approach control services, for such airspaces, as are specified for endorsements also annotated on the licence.

(b) The holder of an approach radar control rating must have demonstrated a level of knowledge in at least the following subjects to the extent that they affect the area of responsibility:

- (i) airspace structure;
- (ii) applicable rules, procedures and sources of information;
- (iii) air navigation facilities;
- (iv) air traffic control equipment and its use;
- (v) terrain and prominent landmarks;
- (vi) characteristics of air traffic and traffic flow;
- (vii) weather phenomena;
- (viii) emergency and search and rescue plans;
- (ix) principles, use and limitations of radar, other surveillance systems and associated equipment; and
- (x) procedures for the provision of approach and area radar control services including procedures to ensure appropriate terrain clearance.

Standard No: - 11.2 FACILITIES AND EQUIPMENT

Regulation 18

1) (a) Major types of equipment associated with ATC services include:

- i) very high frequency omni-directional range (VOR);
- ii) non-directional radio beacon (NDB);
- iii) long-range radio navigation aids;
- iv) communication equipment;
- v) primary and secondary radar;
- vi) radar presentation equipment;
- vii) automated systems;
- viii) instrument landing system (ILS);
- ix) very high frequency direction-finding (VDF).

(b) All equipment must meet the standards in Annex 10. General guidelines and information concerning ATC equipment can be found in Air Traffic Services Planning Manual Part III.

2) General Operational Requirements

(a) At all ATS units, the controller must be provided with a suitable environment and appropriate equipment. The environment should be safe and comfortable and should afford protection from the elements as well as adequate air-conditioning and ventilation. Operating space should be ample without being spacious. Controllers should be able to work at their positions without physical discomfort, e.g. chairs should be strong and comfortable while providing proper back support, be adjustable in height, and easily movable. The environment should be sufficiently free from noise so as to be conducive to mental concentration.

3) Aerodrome Control Tower Operational Requirements

(a) An aerodrome control tower has two major operational requirements for an air traffic controller to be able to properly control aircraft operating on and in the vicinity of the aerodrome. Those requirements are:

- i) the tower must permit the controller to survey those portions of the aerodrome and its vicinity over which he exercises control;
- ii) the tower must be equipped so as to permit the controller rapid and reliable communications with aircraft with which he is concerned.

(b) Surveillance by the aerodrome controller is normally done by visual means (eyesight) alone, sometimes mechanically through the use of binoculars to improve eyesight, or electronically, through the use of radar. The controller must be able to discriminate between aircraft and between aircraft and vehicles while they are on the same or different runways and/or taxiways.

(c) The height of the tower should be such that, at normal eye level (about 1.5 m above the floor of the tower cab) the controller is provided with the ability to do visual surveillance. Reflections in the cab glass and sun or lamp glare through the windows should be kept to a minimum. Vertical supports for the cab roof should be kept to the smallest feasible diameter so as to

minimize their obstruction of the controller's view. For the same reason, tower consoles should be designed so as not to adversely affect the controllers' vision.

(d) The tower controller must be provided with the capability to communicate rapidly, clearly and reliably with aircraft in his area of responsibility. Normally, this is accomplished through air-ground communications. It may occasionally be done by means of a light-gun from the tower using specified signals and prescribed acknowledgements from the aircraft. Since operations in and around a control tower generate a fair amount of noise (e.g. aircraft engines,), the provision of sound deadening features in control towers is very important

(e) The layout of working positions within the tower cab and the consequential arrangement of operating consoles will be determined by the location of the tower in relation to the manoeuvring area, and the approach direction which is most frequently used at the aerodrome in question. It is also determined by the number of operating positions which are occupied simultaneously in the tower and the respective responsibilities of these positions (control of arriving and departing traffic versus that of ground movements, clearance delivery position, operation of the lighting panel, etc.).

4) Aerodrome Control Tower Accommodations And Equipment

a) The tower cab should be fitted with consoles to house equipment and provide desk space of the same height as the consoles for writing as well as space to mount monitoring equipment such as aerodrome lighting panels, instrument landing system (ILS) monitor panels, telephone and radio selector panels and brackets to hold microphones and telephone handsets. The console desks should also provide support for flight progress strip holders and should have radio/telephone connexions, including those used for monitoring. A supervisor's desk(s) should be provided with necessary telephone and radio terminals and a bookcase should be available to keep appropriate reference material.

5) General lighting of operating rooms should be kept at a low ambient level consistent with good working conditions and with reflections reduced as much as possible. However, the floor area should be sufficiently illuminated to prevent accidents. The aerodrome lighting control panel should be incorporated in a cab console or in a separate desk. Radio and telephone selector panels should be installed at the control positions and should include emergency and other special use telephone equipment. Other cab equipment includes wind direction and speed indicators, altimeter readout indicator, light-gun(s) and clock(s).

6) Area/Terminal Control Unit Requirements

a) At individual operating positions within the Area/Terminal unit, the radio, intercom and telephone control panels should be located within easy reach of the controller and should be simple to operate with quick response times. Connexions for headsets and telephones should be conveniently located and should be duplicated to permit monitoring of controllers and/or trainees as necessary. Additionally, a separate desk equipped with telephone and communications channels should be provided in a convenient location for the watch supervisor. To keep the noise level down, every controller position as well as each co-ordinator position and the watch supervisor position should be equipped with an interphone system and headsets.

7) Air Traffic Control Operations Equipment

- a. Headsets
- b. Microphone
- c. Transceiver
- d. Speakers
- e. Radio selector panel
- f. Telephone selector panel/handsets
- g. Intercom
- g. Auto-switch headset/speaker
- i. Recorder (radio and telephone)
- j. Power
- k. Back-up power
- l. Signal lamp and reel
- m. Wind speed and direction display
- n. Barometric altimeter
- o. Altimeter setting indicator
- p. Clock
- q. Aerodrome lighting panel
- u. Navaid(s) monitor panel
- v. Lighting, including emergency lights
- w. Radar/display consoles
- x. Flight data panel
- y. Automation equipment
- x. Clipboards/displays (NOTAM etc.)
- aa. ATIS recorder
- bb. Fire alarm and extinguishers
- cc. Desks/consoles/shelves
- dd. Chairs
- ee. Shades
- ff. Air conditioning,
- gg. Convenience group (hot-plate/water, etc.)
- hh. Lunch facility
- ii. Water fountain

jj. Bookcases

kk. Binoculars

ll. Sound-absorbing coverings (floor/wall)

mm. Flight progress boards

Standard NO: - 11.3 TRAINING AND CHECKING PROGRAM

Regulation 19

1) An ATS provider shall:

- a) develop and conduct of courses of instruction to meet operational ATC needs.
- b) establish procedures to ensure training courses and materials are updated to meet the any changes needed .
- c) provide guidelines in relation to prerequisites for admission to Air Traffic technical training courses.
- d) provide for the evaluation of ongoing training programs as required.
- e) maintain the technical accuracy/currency of ATS courses;
- f) develop instructional materials (lesson plans, visual aids, handouts, etc.) for each of ATS course
- g) develop written and or oral course examinations as necessary.
- h) develop special programmes for such areas as proficiency, management, remedial, OJT and refresher training.
- i) develop self study materials to meet specific needs (eg student preparation for promotional examinations)

2) A training program shall be provided to the Director by an ATS provider. An ATS Training Program shall include the following elements:

- a) Programme objectives
- b) Training policy
- c) Administrative directives
- d) Instructional practices
- e) Curriculum
- f) Course Syllabi
- g) Sample Lesson Plan
- h) Training manuals
- i) Yearly Training plan
- j) Testing System

Standard NO: -11.4 Safety Management System

Regulation 20

1. GENERAL

a) An ATS provider shall ensure that the level of air traffic services (ATS) and communications, navigation and surveillance, as well as the ATS procedures applicable to the airspace or aerodrome concerned, are appropriate and adequate for maintaining an acceptable level of safety in the provision of ATS.

b) To ensure that safety in the provision of ATS is maintained, an ATS provider shall implement formal and systematic safety management programmes for the air traffic services under its jurisdiction. Where possible the ATS safety management programmes should be established on the basis of a regional air navigation agreement.

2. OBJECTIVES

The objectives of ATS safety management are to ensure that:

a) the established level of safety applicable to the provision of ATS within an airspace or at the aerodrome is met; and

b) safety-related enhancements are implemented whenever necessary.

3. ATS SAFETY MANAGEMENT ACTIVITIES

a) An ATS safety management programme shall include, *inter alia*, the following with respect to the provision of air traffic services:

i) monitoring of overall safety levels and detection of any adverse trend;

ii) safety reviews of ATS units;

iii) safety assessments in respect of the planned implementation of airspace re-organizations, the introduction of new equipment systems or facilities, and new or changed ATS procedures; and

iv) a mechanism for identifying the need for safety enhancing measures.

b) All activities undertaken in the ATS safety management programme shall be fully documented.

c) All documentation shall be retained for two years

4. MONITORING OF SAFETY LEVELS

a) Data for use in safety monitoring programmes shall be collected from as wide a range of sources as possible, as the safety-related consequences of particular procedures or systems may not be realized until after an incident has occurred.

b) An ATS provide shall establish a formal incident reporting system for ATS personnel to facilitate the collection of information on actual or potential safety hazards or deficiencies related to the provision of ATS, including route structures, procedures, communications, navigation and surveillance systems and other safety significant systems and equipment as well as controller work loads.

5) Review of incident and other safety-related reports

a) Safety-related reports concerning the operation of air traffic services, including air traffic incident reports, shall be systematically reviewed by the ATS provider in order to detect any adverse trend in the number and types of incidents which occur.

b) Reports concerning the serviceability of ATS facilities and systems, such as failures and degradations of communications, surveillance and other safety significant systems and equipment, shall be systematically reviewed by the ATS provider in order to detect any trend in the operation of such systems which may have an adverse effect on safety.

6. SAFETY REVIEWS

a) General requirements

Safety reviews of ATS units shall be conducted on a regular and systematic basis by personnel qualified through training, experience and expertise and having a full understanding of relevant Standards and Recommended Practices (SARPs), Procedures for Air Navigation Services (PANS), safe operating practices and Human Factors principles.

b) Scope

The scope of ATS unit safety reviews should include at least the following issues:

i) Regulatory issues to ensure that:

- A) ATS operations manuals, ATS unit instructions and air traffic control (ATC) coordination procedures are complete, concise, and up-to-date;
- B) the ATS route structure, where applicable, provides for:
 - 1) adequate route spacing; and
 - 2) crossing points for ATS routes located so as to reduce the need for controller intervention and for inter- and intra-unit coordination;
- C) the separation minima used in the airspace or at the aerodrome are appropriate and all the provisions applicable to those minima are being complied with;
- D) appropriate procedures for low visibility aerodrome operations are in place;
- E) traffic volumes and associated controller work loads do not exceed defined, safe levels and that procedures are in place for regulating traffic volumes whenever necessary;
- F) procedures to be applied in the event of failures or degradations of ATS systems, including communications, navigation and surveillance systems, are practicable and will provide for an acceptable level of safety; and
- G) procedures for the reporting of incidents and other safety-related occurrences are implemented, that the reporting of incidents is encouraged and that such reports are reviewed to identify the need for any remedial action.

ii) Operational and technical issues to ensure that:

- A) the environmental working conditions meet established levels for temperature, humidity, ventilation, noise and ambient lighting, and do not adversely affect controller performance;
- B) automation systems generate and display flight plan, control and coordination data in a timely, accurate and easily recognizable manner and in accordance with Human Factors principles;
- C) equipment, including input/output devices for automation systems, are designed and positioned in the working position in accordance with ergonomic principles;

D) communications, navigation, surveillance and other safety significant systems and equipment:

- I) are tested for normal operations on a routine basis;
- II) meet the required level of reliability and availability;
- III) provide for the timely and appropriate detection and warning of system failures and degradations;
- IV) include documentation on the consequences of system, sub-system and equipment failures and degradations;
- V) include measures to control the probability of failures and degradations; and
- VI) include adequate back-up facilities and/or procedures in the event of a system failure or degradation; and

E) detailed records of systems and equipment serviceability are kept and periodically reviewed.

Note.— In the context above, the terms reliability and availability have the following meanings:

- 1) **Reliability.** *The probability that a device or system will function without failure over a specified time period or amount of usage; and*
- 2) **Availability.** *The ratio of percentage of the time that a system is operating correctly to the total time in that period.*

iii) *Licensing and training issues* to ensure that:

- A) controllers are adequately trained and properly licensed with valid ratings;
- B) controller competency is maintained by adequate and appropriate refresher training, including the handling of aircraft emergencies and operations under conditions with failed and degraded facilities and systems;
- C) controllers, where the ATC unit/control sector is staffed by teams, are provided relevant and adequate training in order to ensure efficient teamwork;
- D) the implementation of new or amended procedures, and new or updated communications, surveillance and other safety significant systems and equipment is preceded by appropriate training and instruction;
- E) controller competency in the English language is satisfactory in relation to providing ATS to international air traffic; and
- F) standard phraseology is used.

7. SAFETY ASSESSMENTS

a) Need for safety assessments

(i) A safety assessment shall be carried out in respect of proposals for significant airspace reorganizations, for significant changes in the provision of ATS procedures applicable to an airspace or an aerodrome, and for the introduction of new equipment, systems or facilities, such as:

- A) a reduced separation minimum to be applied within an airspace or at an aerodrome;

- B) a new operating procedure, including departure and arrival procedures, to be applied within an airspace or at an aerodrome;
- C) a reorganization of the ATS route structure;
- D) a resectorization of an airspace;
- E) physical changes to the layout of runways and/or taxiways at an aerodrome; and
- F) implementation of new communications, surveillance or other safety-significant systems and equipment, including those providing new functionality and/or capabilities.

Note 1.— A reduced separation minimum may refer to the reduction of a horizontal separation minimum, including a minimum based on required navigation performance (RNP), a reduced vertical separation minimum of 300 m (1 000 ft) between FL 290 and FL 410 inclusive (RVSM), the reduction of a radar separation or a wake turbulence separation minimum or reduction of minima between landing and/or departing aircraft.

Note 2.— When, due to the nature of the change, the acceptable level of safety cannot be expressed in quantitative terms, the safety assessments may rely on operational judgement.

(ii) Proposals shall be implemented only when the assessment has shown that an acceptable level of safety will be met.

b) Safety-significant factors

The safety assessment shall consider relevant all factors determined to be safety-significant, including:

- i) types of aircraft and their performance characteristics, including aircraft navigation capabilities and navigation performance;
- ii) traffic density and distribution;
- iii) airspace complexity, ATS route structure and classification of the airspace;
- iv) aerodrome layout, including runway configurations, runway lengths and taxiways configuration;
- v) type of air-ground communications and time parameters for communication dialogues, including controller intervention capability;
- vi) type and capabilities of surveillance system, and the availability of systems providing controller support and alert functions; and
- vii) any significant local or regional weather phenomena.

8. SAFETY-ENHANCING MEASURES

(a) Any actual or potential hazard related to the provision of ATS within an airspace or at an aerodrome, whether identified through an ATS safety management activity or by any other means, shall be assessed and classified by the ATS provider for its risk acceptability. Except when the risk can be classified as acceptable, the ATS provider concerned shall, as a matter of priority and as far as practicable, implement appropriate measures to eliminate the risk or reduce the risk to a level that is acceptable.

(b) If it becomes apparent that the level of safety applicable to an airspace or an aerodrome is not, or may not be achieved, the ATS provider shall, as a matter of priority and as far as practicable, implement appropriate remedial measures. Implementation of any remedial measure

shall be followed by an evaluation of the effectiveness of the measure in eliminating or mitigating a risk.

Standard NO: - 11.5 CONTINGENCY PLANNING
Regulation 23

1. ATS provider shall develop and promulgate contingency plans for implementation in the event of disruption, or potential disruption, of air traffic services and related supporting services in the airspace for which they are responsible for the provision of such services. Such contingency plans shall be developed with the assistance of ICAO as necessary, in close coordination with the air traffic services authorities responsible for the provision of services in adjacent portions of airspace and with airspace users concerned

2. Elements to be considered in a contingency plan:

a) re-routing of traffic to avoid the whole or part of the airspace;

b) establishment of a simplified route network through the airspace, together with a flight level allocation scheme to ensure lateral and vertical separation and a procedure for adjacent area control centres to establish longitudinal separation at entry point and to maintain such separation through the airspace;

c) re-assignment of responsibility for providing air traffic services; in the airspace;

d) provision and operation of adequate air-ground communications, AFTN and ATS direct speech links, including reassignment to adjacent States of the responsibility for providing meteorological information and information on navigation aids;

e) special arrangements for making, collecting and disseminating in-flight and post-flight reports from aircraft;

f) a requirement for aircraft to maintain continuous listening watch on a specified pilot-pilot VHF frequency; and to broadcast, position information and estimates on that frequency, including start and completion of climb and descent;

g) a requirement for all aircraft in specified areas to display navigation and anti-collision lights at all times;

h) a requirement and procedures for aircraft to maintain their own longitudinal separation from preceding aircraft at the same cruising level;

i) a requirement for climbing and descending well to the right of the centre line of specifically identified routes;

j) establishment of arrangements for controlled access to the contingency area to prevent overloading of the contingency system;

k) a requirement for all operations in the contingency area to be conducted in accordance with IFR, including allocation of IFR flight levels from the Table of Cruising Levels in Appendix 3 of Annex 2 of ATS routes in the area.

l) Notification by NOTAM to users of air navigation services of anticipated or actual disruption of air traffic services;

m) Notification by NOTAM of discontinuance of contingency measures and re-activation of the services set forth in the regional air navigation plan;

Standard NO: - 11.6 SECURITY PROGRAM
Regulation 24(2)

Evacuation of air traffic services

An ATS provider shall develop specific procedures to cover the possible need for evacuation of air traffic services (ATS) units in the event of a bomb threat. These procedures can be included in the overall contingency plan. The following matters should be covered by the procedures:

- a) the authority for and the means and methods of issuing orders for evacuation;
 - b) the unit or units to which the responsibility for temporary provision of air traffic services should be transferred;
 - c) the means and methods of notifying the unit(s) mentioned in b) and of transferring essential flight data to such units;
 - d) the means and methods of notifying aircraft in flight of the situation and of the procedures to be applied by them;
 - e) the means and methods of notifying aircraft on the ground and operators of the situation;
- and
- f) resumption of normal activities following elimination or cancellation of the bomb threat, including the means and methods of issuing orders for such resumption.

Standard NO: - 11.7 AERONAUTICAL TELECOMMUNICATIONS SYSTEMS
Regulation 26(1)(b)

1. Aeronautical Telecommunication Services

Aeronautical telecommunication services are the ground-based stations that support the provision of Air Traffic Services. Airborne stations are not included. Aeronautical telecommunication services include the following:

- (a) Aeronautical Broadcasting Service. A broadcasting service intended for the transmission of information relating to air navigation.
- (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 interoperate 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.
Note: This service does not include ground stations that are provided for other than ATS purposes.
- (f) Any telecommunication service which processes or displays air traffic control data (including aviation meteorological data) for use by an ATS provider.
- (g) Electronic briefing and flight plan lodgement service for the use of pilots.

2. Aeronautical Radio Navigation services

A radio navigation service intended for the benefit, and for the safe operation of aircraft. Radio navigation services include radio determination (radar surveillance services) supporting ATS.

3. Aeronautical Telecommunication and Radio Navigation Facilities

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.

4. *Technician Qualifications*

(a) Technicians performing operation and maintenance functions associated with aeronautical telecommunication facilities and/or radio navigation facilities should be suitably qualified in one of the following:

- (i) radio engineering;
- (ii) communications engineering;
- (iii) electrical engineering;
- (iv) electronic engineering;
- (v) computer science;

- (vi) information technology; or
- (vii) qualifications equivalent to the above qualifications.

(b) 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.

Where an aeronautical telecommunications provider considers, and Director 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.

5. Technician Training and Certification

(a) Approved aeronautical telecommunications providers shall provide technicians with an authorising certificate which:

- (i) establishes the identity of the technician;
- (ii) 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
- (iii) includes a date of effect, and the period of time for which each of the authorisations remain current.

(b) An aeronautical telecommunications provider 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:

- (i) has undergone a competency based course of instruction or on-the-job training specific to that facility or that class of facility; and
- (ii) has been assessed to be competent in the operation and maintenance of the facility;

6. Refresher Training and Recency Checking Procedure

Approved aeronautical telecommunications providers 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.

7. Documents to be Held by the Provider

Documentation that is essential for the provision of services 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 aeronautical telecommunications providers;
- (f) facility technical manuals or instructions;
- (g) local instructions and technical procedures; and
- (h) safety information.

8. Test Facilities for Aeronautical Telecommunication or Radio Navigation Services and Facilities

(a) An aeronautical telecommunications provider shall have available the necessary test facilities for use in the operation and maintenance of services and facilities. Aeronautical telecommunications providers shall use documented procedures to control, calibrate, and maintain test equipment.

(b) Calibrated test equipment shall be used in maintenance of a service or facility. Calibration shall be carried out at prescribed intervals for each type of test equipment and the calibration is traceable to national measurement standards. Records of the calibration status of each item of test equipment shall be retained.

(c) Each item of test equipment shall carry a visual identification of its calibration status, the date that the equipment was last calibrated, and the prescribed calibration periodicity.

(d) An aeronautical telecommunications provider shall assess the validity of previous test results whenever an item of test equipment is found to be out of calibration.

8. Document and Data Control Processes

Document and data control processes are those which control the authorisation, publication, distribution, and amendment, of all documentation issued, or required, by the aeronautical telecommunications provider. 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.

9 Record System

The records system and procedures shall identify, collect, index, store, and maintain records necessary for the safe provision of services. The procedures must ensure that legible and permanent records are kept which provide a traceable history over the lifecycle of services. Records to be 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.

10. *Site Logs*

(a) Site logs shall be kept for all facilities used to provide an aeronautical telecommunication service or a radio navigation service. The site log records all occurrences and actions relating to operation, maintenance, modification, failure, faults, and removal from and restoration to service.

(b) 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.

(c) Site log records are retained for at least five years.

11 *Security Program for Aeronautical Telecommunication and Radio Navigation Facilities*

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. 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 radio navigation 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 radio navigation service.

An AIS provider shall establish a procedure to control all required documentation to ensure that—

(1) the documentation is reviewed and authorised by appropriate personnel before issue; and

(2) current issues of relevant documentation are available to staff at all locations where they need access to such documentation for the provision of aeronautical information services; and

(3) all obsolete documentation is promptly removed from all points of issue or use; and

(4) changes to documentation are reviewed and approved by appropriate personnel; and

(5) the current version of each item of documentation can be identified to preclude the use of out-of-date editions.

Collection of information

(a) An AIS provider shall establish procedures to collect and collate the information required for the provision of aeronautical information services. Procedures shall ensure that—

(1) applicable information is obtained from organisations that provide services in support of the Barbados air navigation system;

and

(2) applicable information is obtained from the aeronautical information services of other States relevant to the requirements of international aircraft operators operating—

- (i) in the Adams Terminal Control Area; and
 - (ii) on international air routes originating from Barbados;
- and
- (iii) information received from the information originators is certified as accurate by a person identified by the originator to be responsible for the accuracy of that information.

Error correction in published information

- (a) An AIS provider shall establish procedures to record, investigate, correct, and report any errors that are detected in the aeronautical information published under the authority of their certificate.
- (b) The procedures shall ensure that—
 - (1) the error is corrected by the most appropriate means relative to the operational significance of the error; and
 - (2) the correction is clearly identified in the republished information; and
 - (3) the source of the error is identified and, where possible, eliminated;and
 - (4) the Director is notified of a promulgated information incident.

Records

- (a) An AIS provider shall establish procedures to identify, collect, index, store, maintain and dispose of the records that are necessary for the aeronautical information services .
- (b) The procedures shall ensure that—
 - (1) there are records enabling all incoming and outgoing aeronautical information to be readily identified by serial number and date, and that supplementary information can be similarly verified and, where necessary, authenticated; and
 - (2) there is a record of each person who is authorised by the applicant to check, edit, and publish aeronautical information; and
 - (3) there is a record of each occurrence of error correction; and
 - (4) there is a record of each internal quality assurance review of the organisation carried out as required; and
 - (5) all records are legible and of a permanent nature; and
 - (6) all records shall be retained for at least 5 years except NOTAM, AIP Supplements and Aeronautical Information Circulars, which need only be retained for 30 days after cancellation.

Internal quality assurance

- (a) An AIS provider shall establish internal quality assurance procedures to ensure compliance with, and the adequacy of, the procedures;
- (b) The procedures shall specify—

- (1) the level of quality that the AIS provider intends to achieve; and
 - (2) the level and frequency of internal reviews; and
 - (3) the person or persons responsible for carrying out the internal reviews; and
 - (4) how the findings of the internal reviews are to be recorded and reported to the Director; and
 - (5) how quality indicators such as error reports, incidents, and complaints are incorporated into the internal quality assurance procedures; and
 - (6) the senior person's responsibilities for analysis and overview of the internal reviews; and
 - (7) the means for rectifying any deficiencies found during an internal review; and
 - (8) the documentation requirements for all aspects of the review.
- (c) The senior person who has the responsibility for internal quality assurance shall have direct access to the Chief AIS Officer on matters affecting the adequacy, accuracy, timeliness, format, and dissemination of the published aeronautical information.

Standard NO: - 11.8 PROVISION OF AVIATION WEATHER SERVICES
Regulation 29

Personnel requirements

(a) a meteorological service provider shall engage, employ or contract sufficient personnel to plan, operate, supervise, inspect, and certify the meteorological offices and facilities and provide the meteorological services.

(b) a meteorological service provider shall—

(1) establish a procedure to assess the competence of those personnel who are authorised to—

(i) place facilities into operational service; and

(ii) supervise the production and release of meteorological information; and

(2) establish a procedure to maintain the competence of those authorised personnel; and

(3) provide those authorised personnel with written evidence of the scope of their authorisation.

Site requirements

A meteorological service provider shall establish procedures to ensure that—

(1) the meteorological office and facilities listed in the authorisation is—

(i) sited and configured in accordance with security measures designed to prevent unlawful or accidental interference;

and

(ii) provided with suitable power supplies and means to ensure appropriate continuity of service; and

(2) each remote weather sensing facilities is installed and maintained in a technically appropriate position to ensure that the facility provides an accurate representation of the local meteorological conditions.

Communication requirements

(a) a meteorological service provider shall establish communication systems and procedures to ensure that the meteorological office and associated facilities can provide the meteorological information for which it is intended.

(b) The communication systems and procedures must be able to handle the volume and nature of the meteorological information being communicated so that no meteorological information is delayed to the extent that the information becomes out-of-date.

Input requirements

(a) A meteorological service provider shall establish procedures to obtain input meteorological information appropriate for the meteorological services being provided.

(b) The procedures shall ensure that—

- (1) a meteorological office and facility that provides a forecast service has continuing access to appropriate historical, real-time, and other meteorological information for the applicant's forecast areas; and
- (2) a meteorological office and facility that provides a meteorological briefing service in person or by any other interactive visual means, has adequate display and briefing resources available for the briefings; and
- (3) a meteorological office and facility that provides a meteorological reporting service has adequate observing systems to supply adequate, accurate and timely meteorological reports; and
- (4) a meteorological office that provides a meteorological watch service has adequate meteorological information to supply an adequate, accurate and timely meteorological watch service; and
- (5) a meteorological office and facility that provides a climatology service has adequate meteorological information for the preparation of climatological information.

Output requirements

(a) A meteorological service provider shall—

- (1) identify the output meteorological information to be provided by the service; and
- (2) determine the standards and formats for that output meteorological information.

(b) A meteorological service provider shall establish procedures to ensure that the meteorological information supplied complies with the standards and formats determined under paragraph (a)(2).

Facility requirements

A meteorological service provider shall establish procedures to ensure that all electronic data processing facilities used in the acquisition, compilation, computing, access or dissemination of meteorological information are of a nature, configuration and capability to ensure the adequacy, accuracy and timeliness of that meteorological and related information.

Documentation

(a) A meteorological service provider shall hold copies of meteorological office manuals, facility manuals, technical standards and practices, procedures manuals, and any other documentation that is necessary for the provision of the meteorological services.

(b) A meteorological service provider shall establish a procedure to control the documentation required by paragraph (a). The procedure shall ensure that—

- (1) the documentation is reviewed and authorised by appropriate personnel before issue; and
- (2) current issues of relevant documentation are available to personnel at all locations where they need access to such documentation for the provision of the meteorological services and
- (3) obsolete documentation is promptly removed from all points of issue or use; and

- (4) changes to documentation are reviewed and approved by appropriate personnel; and
- (5) the current version of each item of documentation can be identified to preclude the use of out-of-date editions.

Verification, periodic inspection, testing and calibration

(a) A meteorological service provider shall establish procedures for—

- (1) the routine verification of meteorological information obtained and provided by the applicant; and
- (2) the periodic inspection of each meteorological office; and
- (3) the periodic inspection, testing and calibration of each facility.

(b) The procedures shall ensure that—

- (1) the systems required for the routine verification of meteorological information have the capability and integrity necessary for verifying the meteorological information; and
- (2) appropriate inspection equipment and systems are available to personnel for the inspection of each meteorological office; and
- (3) appropriate inspection, measuring and test equipment and systems are available to personnel for the inspection, testing and calibration of each facility; and
- (4) the inspection, measuring and test equipment and systems have the precision and accuracy necessary for the inspections, measurements and tests being carried out; and
- (5) all meteorological sensing facilities are calibrated and configured so that the environmental sensors fitted or incorporated yield, as far as possible, reliable, accurate and representative meteorological information.

Release of meteorological information

(a) A meteorological service provider shall establish procedures for—

- (1) the release of meteorological information; and
- (2) the placing of facilities into operational service.

(b) The procedures shall ensure that persons authorised to supervise the production and release of meteorological information and persons authorised to place meteorological facilities into operational service have been assessed as competent..

Notification of meteorological office and facility status

(a) A meteorological service provider shall establish procedures to notify users of the meteorological services of relevant operational information and of any changes in the operational status of each meteorological office or facility.

(b) The procedures shall ensure that—

(1) the operational information that support the Barbados air navigation system or an air traffic service is forwarded to the Aeronautical Information Service for publication in the Barbados Aeronautical Information Publications; and

(2) the users of a meteorological office or facility are notified without delay of any change in the operational status of the meteorological office or facility if the change may effect the safety of air navigation. Any change to the operational status shall be forwarded to the Aeronautical Information Service for the issue of a NOTAM.

Meteorological information check after accident or incident

(a) A meteorological service provider shall establish procedures for checking the adequacy, accuracy and timeliness of any of their meteorological information that may have been used by an aircraft or an air traffic service involved in an accident or incident.

(b) The procedures shall ensure that—

(1) the checks are carried out as soon as practicable after notification of such an accident or incident; and

(2) copies of the meteorological information are kept in a secure place for possible use by any subsequent investigation.

Malfunctions and erroneous information

A meteorological service provider shall establish procedures—

(1) to identify, record, notify, investigate and rectify any report of erroneous meteorological information; and

(2) to identify, record, notify, investigate and rectify any detected malfunction in the facilities and meteorological services that may result in the supply of erroneous meteorological information; and

(3) to notify without delay all users that have received the erroneous meteorological information; and

(4) to notify the DCA of Civil Aviation (DCA), within 12 hours, of those malfunctions that cannot be remedied within 72 hours; and

(5) for the continuation of malfunction status reports in the event that such reports are required by the DCA.

Records

(a) A meteorological service provider shall establish procedures to identify, collect, index, store, maintain and dispose of the records that are necessary for the supply of the meteorological services.

(b) The procedures shall ensure that—

(1) there is a record of the input meteorological information; and

(2) there is a record of all output meteorological information and

- (3) the records specified in paragraph (b)(1) and (2) are retained for a period of at least 60 days or for such longer period as may be required by the DCA; and
- (4) there is a record in order to document the performance of the meteorological office and facility and to provide a traceable history of its maintenance, service and product quality, its periodic inspections, and the persons responsible for each of these activities; and
- (5) there is a record of the equipment and systems used for verification, inspection, testing and calibration. The record shall provide a traceable history of the location, maintenance, and calibration checks for the equipment and systems; and
- (6) there is a record of each occurrence of erroneous meteorological information reported and of each malfunction detected. The record shall detail the nature of the erroneous meteorological information or malfunction and the findings of the investigation and the follow-up corrective actions; and
- (7) there is a record of each internal quality assurance review. The record shall detail the part or activity of the organisation that was reviewed, the findings of the review and any necessary follow-up corrective actions; and
- (8) there is a record for each person who is authorised by the meteorological service provider to supervise the production and release of meteorological information and for each person who is authorised to place facilities into operational service. The record shall include details of their experience, qualifications, training and current authorisations; and
- (9) all records are legible, and of a permanent nature; and
- (10) all records other than those required by paragraph (b)(1) and (2) are retained for at least one year, or for such longer period as may be required by the DCA, in order to establish a history of the performance of the meteorological services.

Quality assurance

(a) A meteorological service provider shall establish internal quality assurance procedures to ensure compliance with, and the adequacy of, the procedures and systems required by this standard.

Procedures shall be set out for the operation and maintenance of the meteorological office and associated facilities and shall include a list of—

- (1) the meteorological information and meteorological services provided; and
- (2) the minimum acceptable operating parameters and standards for facilities; and
- (3) the minimum meteorological inputs required; and
- (4) the minimum performance and quality levels for output meteorological information and meteorological services provided; and
- (5) the test equipment and systems required for the measurement of the minimum levels listed under subparagraph (4); and
- (6) any mandatory check procedures for releasing meteorological information.

Safety inspections and audits

(a) The DCA may in writing require a meteorological service provider to undergo or carry out such inspections and audits of the meteorological offices, facilities, documents, and records as the DCA considers necessary in the interests of civil aviation safety and security in accordance with Section 15 of the Civil Aviation Act.

(b) The DCA may require from a meteorological service provider such information as the DCA considers relevant to the inspection or audit.