



# **Part 171**

## **Certification of Communications, Navigation and Surveillance CNS Facilities**

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## **SUBPART A**

### **General**

#### **171.1 Applicability**

This PART prescribes rules governing the certification of:

- (a) CNS facilities and equipment providing air traffic services.
- (b) CNS maintenance organization.
- (c) As of the end of 2006, no CNS facilities are provided or serviced except under provisions of a facility certificate issued under this Part.

#### **171.3 Definitions**

**Accounting management.** An ATN systems management facility to monitor users for use of network resources and to limit the use of those resources.

**ADS application.** An ATN application that provides ADS data from the aircraft to the ATS unit(s) for surveillance purposes.

**Advanced surface movement guidance and control system (A-SMGCS).**

A system provides routing, guidance and surveillance for the control of aircraft and vehicles in order to maintain the declared surface movement rate under all weather conditions within the aerodrome visibility operational level (AVOL) while maintaining the required level of safety.

**Aeronautical administrative communication (AAC).** Communication used by aeronautical operating agencies related to the business aspects of operating their flights and transport services. This communication is used for a variety of purposes, such as flight and ground transportation, bookings, deployment of crew and aircraft or any other logistical purposes that maintain or enhance the efficiency of over-all flight operation.

**Aeronautical Radio Navigation Service:** A radio navigation service intended for the benefit and for the safe operation of aircraft.

Note. — The following Radio Regulations are quoted for purposes of reference and/or clarity in understanding of the above definition of the aeronautical radio navigation service:

RR S1.10 Radio navigation: Radiodetermination used for the purpose of navigation, including obstruction warning.

RR S1.9 Radiodetermination: The determination of the position, velocity and/or other characteristics of an object, or the obtaining of information relating to these parameters, by means of the propagation properties of radio waves.

**Aeronautical Telecommunication Service:** A telecommunication service provided for any aeronautical purpose.

**Alternative means of communication.** A means of communication provided with equal status, and in addition to the primary means.

**ATS direct speech circuit:** An aeronautical fixed service (AFS) telephone circuit, for direct exchange of information between air traffic services (ATS) units.

**Aeronautical operational control (AOC).** Communication required for the exercise of authority over the initiation, continuation, diversion or termination of flight for safety, regularity and efficiency reasons.

**Aeronautical passenger communication (APC).** Communication relating to the non-safety voice and data services to passengers and crew members for personal communication.

**Aeronautical telecommunication network (ATN).** An internetwork architecture that allows ground, air-ground and avionic data subnetworks to interoperate by adopting common interface services and protocols based on the International Organization for Standardization (ISO) Open Systems Interconnection (OSI) reference model.

**AIDC application.** An ATN application dedicated to exchanges between ATS units (ATSUs) of air traffic control (ATC) information in support of flight notification, flight coordination, transfer of control, transfer of communication, transfer of surveillance data and transfer of general data.

**Aircraft earth station (AES).** A mobile earth station in the aeronautical mobile-satellite service located on board an aircraft (see also “GES”).

**Application entity (AE).** Part of an application process that is concerned with communication within the OSI environment. The aspects of an application process that

need to be taken into account for the purposes of OSI are represented by one or more AEs.

**Application information.** Refers to the application names (e.g. AE qualifiers such as ADS and CPC), version numbers, and addresses (the long or short TSAP, as required) of each application.

**Area navigation (RNAV).** A method of navigation which permits aircraft operation on any desired flight path within the coverage of ground- or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination of these.

**ATIS application.** A FIS application that supports the D-ATIS.

**ATN directory services (DIR).** A service which provides the capability for an application entity or user in the ATN community to query a distributed directory data base and retrieve addressing, security and technical capabilities information relating to other users or entities within the ATN community.

**ATN security services.** A set of information security provisions allowing the receiving end system or intermediate system to unambiguously identify (i.e. authenticate) the source of the received information and to verify the integrity of that information.

**ATN systems management (SM).** A collection of facilities to control, coordinate and monitor the resources which allow communications to take place in the ATN environment. These facilities include fault management, accounting management, configuration management, performance management and security management.

**ATS communications (ATSC).** Communication related to air traffic services including air traffic control, aeronautical and meteorological information, position reporting and services related to safety and regularity of flight. This communication involves one or more air traffic service administrations. This term is used for purposes of address administration.

**ATS interfacility data communication (AIDC).** Automated data exchange between air traffic services units, particularly in regard to co-ordination and transfer of flights.

**ATS message handling services (ATSMHS).** Procedures used to exchange ATS messages over the ATN such that the conveyance of an ATS message is in general not correlated with the conveyance of another ATS message by the service provider.

**ATS message handling system (AMHS).** The set of computing and communication resources implemented by ATS organizations to provide the ATS message handling service.

**ATS unit (ATSU).** A generic term meaning variously, air traffic control unit, flight information centre or air traffic services reporting office.  
**ATSC class.** The ATSC class parameter enables the ATSC user to specify the quality of service expected for the offered data. The ATSC class value is specified in terms of ATN end-to-end transit delay at 95 per cent probability.

**Authentication.** A process used to ensure the identity of a person/user/network entity.

**Authorized path.** A communication path that the administrator(s) of the routing domain(s) has pre-defined as suitable for a given traffic type and category.

**Automatic Dependent Surveillance-Broadcast (ADS-B) OUT.** A function on an aircraft or vehicle that periodically broadcasts its state vector (position and velocity) and other information derived from on-board systems in a format suitable for ADS-B IN capable receivers.

**Automatic Dependent Surveillance-Broadcast (ADS-B) IN.** A function that receives surveillance data from ADS-B OUT data sources.

**Average radius of rated coverage.** The radius of a circle having the same area as the rated coverage

**Back course sector.** The course sector which is situated on the opposite side of the localizer from the runway.

**Bit error rate (BER).** The number of bit errors in a sample divided by the total number of bits in the sample, generally averaged over many such samples.

**Broadcast:** A transmission of information relating to air navigation that is not addressed to a specific station or stations.

**Carrier-to-multipath ratio (C/M).** The ratio of the carrier power received directly, i.e. without reflection, to the multipath power, i.e. carrier power received via reflection.

**Carrier-to-noise density ratio (C/No).** The ratio of the total carrier power to the average noise power in a 1 Hz bandwidth, usually expressed in dBHz.

**Channel rate accuracy.** This is relative accuracy of the clock to which the transmitted channel bits are synchronized. For example, at a channel rate of 1.2 kbits/s, maximum error of one part in 106 implies the maximum allowed error in the clock is  $\pm 1.2 \times 10^{-3}$  Hz.

**Channel rate.** The rate at which bits are transmitted over the RF channel. These bits include those bits used for framing and error correction, as well as the information bits. For burst transmission, the channel rate refers to the instantaneous burst rate over the period of the burst.

**Circuit mode.** A configuration of the communications network which gives the appearance to the application of a dedicated transmission path.

**Communications, Navigation and Surveillance (CNS) facilities: which provide the following:**

- (a) Types of communication systems for the aeronautical broadcast service:
  - (1) Meteorological information for aircraft in flight (VOLMET);
  - (2) Automatic Terminal Information Service (ATIS).
- (b) Types of communication systems for aeronautical fixed services:
  - (1) ATS direct speech circuits.
  - (2) Aeronautical Fixed Telecommunication Network (AFTN).
  - (3) ATS Message Handling System (AMHS)
  - (4) Ground-Ground Data Interchange.
- (c) Ground elements of the following types of communication systems for aeronautical radio navigation service:
  - (1) HF air-ground communication.
  - (2) VHF air-ground communication.
  - (3) UHF air-ground communication.
  - (4) HF ground-ground communication (SSB).
  - (5) Satellite ground-ground communications.
  - (6) Microwave communication systems.
- (d) Types of communication systems :
  - (1) Voice Communication Switching System (VCSS).
  - (2) Central Exchange and Telephony System.
- (e) Types of Radio Navigation Aids for Aeronautical Radio Navigation Service:
  - (1) Instrument Landing System (ILS).
  - (2) VHF Omni-Directional Radio Range (VOR).
  - (3) Doppler VOR (DVOR).
  - (4) Distance Measuring Equipment (DME).
  - (5) Non-directive Radio Beacon (NDB).
- (f) Types of Surveillance Radar and Collision Avoidance Systems:
  - (1) Primary Surveillance Radar (PSR).
  - (2) Secondary Surveillance Radar (SSR).
  - (3) Precision Approach Radar (PAR).
  - (4) Multilateration
  - (5) Automatic Dependent Surveillance-Broadcast (ADS-B)
- (g) Types of automation systems that support an air traffic services:
  - (1) Airport Flight Data Processing System (AFDPS).
  - (2) Airspace Management System (AMS).
  - (3) Data Processing & Display System (DPDS).
  - (4) Aircraft Movement Radar Indicator (IRMA).
  - (5) Airfield Overview System (AOS).
  - (6) Aeronautical Fixed Telecommunication Network AFTN / CIDIN/AHMS.
  - (7) Video Camera Surveillance System.
- (h) Any environmental facility to support the above facilities could have one or more of the following systems:
  - (1) Main powers supply system.
  - (2) Uninterrupted Power Supply (UPS) system.
  - (3) Air conditioning system & cooling systems.
  - (4) The fire alarm and firefighting systems

**Configuration management.** An ATN systems management facility for managers to change the configuration of remote elements.

**Context management (CM) application.** An ATN application that provides a log-on service allowing initial aircraft introduction into the ATN and a directory of all other

data link applications on the aircraft. It also includes functionality to forward addresses between ATS units.

**Context management (CM) server.** An ATS facility that is capable of providing application information relating to other ATSUs to requesting aircraft or ATSUs.

**CPDLC application.** An ATN application that provides a means of ATC data communication between controlling, receiving or downstream ATS units and the aircraft, using air-ground and ground-ground subnetworks, and which is consistent with the ICAO phraseology for the current ATC voice communication.

**Collision avoidance logic.** The sub-system or part of ACAS that analyses data relating to an intruder and own aircraft, decides whether or not advisories are appropriate and, if so, generates the advisories. It includes the following functions: range and altitude tracking, threat detection and RA generation. It excludes surveillance.

**Control motion noise (CMN).** That portion of the guidance signal error which causes control surface, wheel and column motion and could affect aircraft attitude angle during coupled flight, but does not cause aircraft displacement from the desired course and/or glide path

**Course sector.** A sector in a horizontal plane containing the course line and limited by the loci of points nearest to the course line at which the DDM is 0.155.

**Critical Performance Parameter:** means a performance parameter that has a direct effect on the operational integrity of a facility.

**Data integrity.** The probability that data has not been altered or destroyed.

**Data link flight information services (D-FIS).** The provision of FIS via data link.

**D-METAR.** The symbol used to designate data link aviation weather report service.

**DME dead time.** A period immediately following the decoding of a valid interrogation during which a received interrogation will not cause a reply to be generated.

**Doppler shift.** The frequency shift observed at a receiver due to any relative motion between transmitter and receiver.

**Double channel simplex.** Simplex using two frequency channels, one in each direction. Note : this method was sometimes referred to as cross-band

**End system (ES).** A system that contains the OSI seven layers and contains one or more end user application processes.

**Effective acceptance bandwidth.** The range of frequencies with respect to the assigned frequency for which reception is assured when all receiver tolerances have been taken into account.

**Effective adjacent channel rejection.** The rejection that is obtained at the appropriate adjacent channel frequency when all relevant receiver tolerances have been taken into account.

**Effective coverage.** The area surrounding an NDB within which bearings can be obtained with an accuracy sufficient for the nature of the operation concerned.

**End-user.** An ultimate source and/or consumer of information.

**End-to-end.** Pertaining or relating to an entire communication path, typically from (1) the interface between the information source and the communication system at the transmitting end to (2) the interface between the communication system and the information user or processor or application at the receiving end.

**Energy per symbol to noise density ratio ( $E_s/N_0$ ).** The ratio of the average energy transmitted per channel symbol to the average noise power in a 1 Hz bandwidth, usually expressed in dB. For A-BPSK and A-QPSK, one channel symbol refers to one channel bit.

**Entity.** An active element in any layer which can be either a software entity (such as a process) or a hardware entity (such as an intelligent I/O chip).

**Equivalent isotropically radiated power (e.i.r.p).** The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna (absolute or isotropic gain).

**Extended hybrid surveillance.** The process of using qualified ADS-B airborne position messages via 1 090 MHz extended squitter without validating 1 090 extended squitter data for the track by ACAS active interrogations.

**Fault management.** An ATN systems management facility to detect, isolate and correct problems.

**FIS application.** An ATN application that provides to aircraft information and advice useful for the safe and efficient conduct of flights.

**Forward error correction (FEC).** The process of adding redundant information to the transmitted signal in a manner which allows correction, at the receiver, of errors incurred in the transmission.

**Front course sector.** The course sector which is situated on the same side of the localizer as the runway.

**Gain-to-noise temperature ratio.** The ratio, usually expressed in dB/K, of the antenna gain to the noise at the receiver output of the antenna subsystem. The noise is expressed as the temperature that a 1 ohm resistor must be raised to produce the same noise power density.

**Ground earth station (GES).** An earth station in the fixed satellite service, or, in some cases, in the aeronautical mobile-satellite service, located at a specified fixed point on land to provide a feeder link for the aeronautical mobile-satellite service.

**Half course sector.** The sector, in a horizontal plane containing the course line and limited by the loci of points nearest to the course line at which the DDM is 0.0775.

**Human Factors principles.** Principles which apply to design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance.

**Hybrid surveillance.** The process of using a combination of active surveillance and passive surveillance with validated data to update an ACAS track to in order to preserve ACAS independence.

**ILS glide path angle.** The angle between a straight line which represents the mean of the ILS glide path and the horizontal.

**Inter-centre communications (ICC).** ICC is data communication between ATS units to support ATS, such as notification, coordination, transfer of control, flight planning, airspace management and air traffic flow management.

**Intermediate system (IS).** A system which performs relaying and routing functions and comprises the lowest three layers of the OSI reference model.

**Internet communications service.** The internet communications service is an internetwork architecture which allows ground, air-to-ground and avionics data subnetworks to interoperate by adopting common interface services and protocols based on the ISO/OSI reference model.

**International Telecommunication Service:** A telecommunication service between offices or stations of different States, or between mobile stations which are not in the same State, or are subject to different States.

**Key down time.** The time during which a dot or dash of a Morse character is being transmitted.

**Magnetic radio bearing:** is one for which the reference direction is that of magnetic North.

**Mean power (of a radio transmitter).** The average power supplied to the antenna transmission line by a transmitter during an interval of time sufficiently long compared with the lowest frequency encountered in the modulation taken under normal operating

**METAR application.** A FIS application that supports the D-METAR.  
**Mode S subnetwork.** A means of performing an interchange of digital data through the use of secondary surveillance radar (SSR) Mode S interrogators and transponders in accordance with defined protocols.

**MLS datum point.** The point on the runway centre line closest to the phase centre of the approach elevation antenna.

**Multilateration (MLAT) System.** A group of equipment configured to provide position derived from the secondary surveillance radar (SSR) transponder signals (replies or squitters) primarily using time difference of arrival (TDOA) techniques. Additional information, including identification, can be extracted from the received signals.

**Navigation specification.** A set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace. There are two kinds of navigation specifications:



**Required navigation performance (RNP) specification.** A navigation specification based on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP, e.g. RNP 4, RNP APCH.

**Area navigation (RNAV) specification.** A navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV, e.g. RNAV 5, RNAV 1.

**Note.1—** The Performance-based Navigation (PBN) Manual (Doc 9613), Volume II, contains detailed guidance on navigation specifications

**Note 2.—** The term RNP, previously defined as “a statement of the navigation performance necessary for operation within a defined airspace”, has been removed from this Annex as the concept of RNP has been overtaken by the concept of PBN. The term RNP in this Annex is now solely used in the context of navigation specifications that require performance monitoring and alerting, e.g. RNP 4 refers to the aircraft and operating requirements, including a 4 NM lateral performance with on-board performance monitoring and alerting that are detailed in Doc 9613.

**Operating position:** means the work station from which one or more air traffic controllers or flight service operators provide air traffic services within an allocated area or areas of responsibility.

**Open systems interconnection (OSI) reference model.** A model providing a standard approach to network design introducing modularity by dividing the complex set of functions into seven more manageable, self-contained, functional layers. By convention these are usually depicted as a vertical stack.

**Offset frequency simplex.** A variation of single channel simplex wherein telecommunication between two stations is effected by using in each direction frequencies that are intentionally slightly different but contained within a portion of the spectrum allotted for the operation.

**Packet layer protocol (PLP).** A protocol to establish and maintain a connection between peer level entities at the network layer, and to transfer data packets between them. In the context of this standard, the term refers to the protocol defined by the ISO 8208 standard used in this document.

**Passive surveillance.** The process of tracking another aircraft without interrogating it, by using the other aircraft's extended squitters. ACAS uses the information obtained via 1 090 MHz extended squitter to monitor the need for active surveillance, but not for any other purpose. Passive surveillance applies to both hybrid and extended hybrid surveillance.

**Packet.** The basic unit of data transfer among communications devices within the network layer.

- **Performance-based navigation (PBN).** Area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace.

**Performance management.** An ATN systems management facility to monitor and evaluate the performance of the systems.

**Point-to-point.** Pertaining or relating to the interconnection of two devices, particularly end-user instruments. A communication path of service intended to connect two discrete end-users; as distinguished from broadcast or multipoint service.

**Protected service volume.** A part of the facility coverage where the facility provides a particular service in accordance with relevant SARPs and within which the facility is afforded frequency protection.

**Primary means of communication.** The means of communication to be adopted normally by aircraft and ground stations as a first choice where alternative means of communication exist.

**Pulse amplitude.** The maximum voltage of the pulse envelope, i.e. A in Figure 3-1.

**Pulse decay time.** The time as measured between the 90 and 10 per cent amplitude points on the trailing edge of the pulse envelope, i.e. between points e and g on Figure 3-1.

**Pulse duration.** The time interval between the 50 per cent amplitude point on leading and trailing edges of the pulse envelope, i.e.

**Pulse rise time.** The time as measured between the 10 and 90 per cent amplitude points on the leading edge of the pulse envelope,

**Radio bearing:** The angle between the apparent direction of a definite source of emission of electro-magnetic waves and a reference direction, as determined at a radio direction finding station. A true radio bearing is one for which the reference direction is that of true North.

**Radio direction-finding station (RR S1.91).** A radio determination station using radio direction finding.

**Note.** — The aeronautical application of radio direction finding is in the aeronautical radio navigation service.

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

**Rated air navigation facility:** means an air navigation facility (Airdrome, area control center, air navigation station, flight information service station, air/ground communication center) holding a current certificate issued by ECAA.

**Rated air navigation facility maintenance engineer/technician:** means maintenance engineer/technician holding a current license, and a rating, or ratings, validated for the particular facility.

**Reply efficiency.** The ratio of replies transmitted by the transponder to the total of received valid interrogations.

**Service Agreement:** means an agreement between the CNS facilities inside /outside the organization.

**Security management.** An ATN systems management facility for access control, authentication and data integrity.

**Slotted aloha.** A random access strategy whereby multiple users access the same communications channel independently, but each communication must be confined to a fixed time slot. The same timing slot structure is known to all users, but there is no other coordination between the users.

**Subnetwork.** An actual implementation of a data network that employs a homogeneous protocol and addressing plan and is under control of a single authority.

**Surveillance radar.** Radar equipment used to determine the position of an aircraft in range and azimuth.

**Switched virtual circuit (SVC).** The primary circuit management technique provided within the ISO 8208 protocol. The network resources are dynamically allocated when needed and released when no longer required.

**System level requirement.** The system level requirement is a high-level technical requirement that has been derived from operational requirements, technological constraints and regulatory constraints (administrative and institutional). The system level requirements are the basis for the functional requirements and lower-level requirements.

**Single channel simplex.** Simplex using the same frequency channel in each direction.

**Time Difference of Arrival (TDOA).** The difference in relative time that a transponder signal from the same aircraft (or ground vehicle) is received at different receivers.

**Time division multiple access (TDMA).** A multiple access scheme based on time-shared use of an RF channel employing: (1) discrete contiguous time slots as the fundamental shared resource; and (2) a set of operating protocols that allows users to interact with a master control station to mediate access to the channel.

**Time division multiplex (TDM).** A channel sharing strategy in which packets of information from the same source but with different destinations are sequenced in time on the same channel.

**Touchdown:** The point where the nominal glide path intercepts the runway.

**Traffic information service – broadcast (TIS-B) IN.** A surveillance function that receives and processes surveillance data from TIS-B OUT data sources.

**Traffic information service – broadcast (TIS-B) OUT.** A function on the ground that periodically broadcasts the surveillance information made available by ground sensors in a format suitable for TIS-B IN capable receivers.

**Transit delay.** In packet data systems, the elapsed time between a request to transmit an assembled data packet and an indication at the receiving end that the corresponding packet has been received and is ready to be used or forwarded.

**Transponder occupancy.** A state of unavailability of the transponder from the time it detects an incoming signal that appears to cause some action or from the time of a self-initiated transmission, to the time that it is capable of replying to another interrogation.

Note.— Signals from various systems that contribute to transponder occupancy are described in the Aeronautical Surveillance Manual (Doc 9924), Appendix M.

**Upper layers (UL)** communications service. A term pertaining to the session, presentation and application layers of the OSI reference model.

**Validation.** The process of verifying the relative position of an intruder using passive information via 1 090 MHz extended squitter by comparing it to the relative position obtained by ACAS active interrogation.

**Virtual origin.** The point at which the straight line through the 30 per cent and 5 per cent amplitude points on the pulse leading edge intersects the 0 per cent amplitude axis

**Wide area multilateration (WAM) system.** A multilateration system deployed to support en-route surveillance, terminal area surveillance and other applications such as height monitoring and precision runway monitoring (PRM).

**Z marker beacon.** A type of radio beacon, the emissions of which radiate in a vertical cone-shaped pattern.

### 171.5 Acronyms

**ACC** Area control center of an aeronautical telecommunication/radio navigation facility certificate.

**ADS-B** Automatic Dependent Surveillance-Broadcast

**AFS** Aeronautical fixed service

**AFTN** Aeronautical fixed telecommunication network

**AIP** Aeronautical information publication

**AIS** Aeronautical information service

**AMHS** ATS Message Handling System

**ATC** Air traffic control

**AT/RN** Aeronautical telecommunication/radio navigation

**CAT II** Category II landing procedure

**CNS** Communications, Navigation and Surveillance

**DME** Distance-measuring system

**FDPS** Flight data processing system

**FIC** Flight information center

**FIR** Flight information region

**ICAO** International civil aviation organization

**IFR** Instrument flight rules

**ILS** Instrument landing system

**NDB** Non-directional radio beacon

**PAR** Precision approach radar

**PSR** Primary surveillance radar

**RCC** Rescue coordination center

**RDPS** Radar data processing system

**RMU** Remote monitoring unit

**SSB** Single side band

**SSR** Secondary surveillance radar

**UHF** Ultra high frequency

**UPS** Uninterrupted power supply

**UTC** Coordinated universal time

**VDL** VHF air ground digital link

**VFR** Visual flight rules

**VHF** Very high frequency

**VOR** Very high frequency omni directional radio range.

## **SUBPART B**

### **Certification Requirements**

#### **171.7 Applications for certificate**

Each applicant for the grant of Communications, Navigation and Surveillance (CNS) facility certificate shall:

- (a) Submit of pre-application form shows intent and prompts the ECAA to allocate resources.
- (b) Complete the application form, which shall require the following information:
  - (1) The applicant's name and address in Egypt.
  - (2) The specifics of CNS facility to be provided.
  - (3) The location of CNS the facility.
  - (4) Name of facility manager, title, telephone number and address.
  - (5) Such other particulars relating to the applicant and the intended facility as may be required by the ECAA as indicated on the form.
- (c) Submit the complete form to the ECAA with the exposition required by 171.45.
- (d) Submit a compliance statement with all the requirements of this Part accompanied with supporting documents as appropriate

#### **171.9 Issuance of certificate**

- (a) The facility will be certificated if the ECAA is satisfied that:
  - (1) The facility meets the requirements of this Part by demonstrating the evidence.
  - (2) The granting of the certificate is not contrary to the interest of aviation safety.
- (b) The applicant shall submit the payment of the appropriate application fee prescribed by ECAA.
- (c) The specifications that are issued with the certificate are a part of that certificate.
- (d) The Specification identify which of the following systems is authorized to provide:
  - (1) Aeronautical telecommunication and switching systems;
  - (2) Radio navigation aid systems;
  - (3) Radar and surveillance systems;
  - (4) Automation systems; or
  - (5) Environmental systems.

#### **171.11 Privileges of certificate holder**

The CNS facility certificate holder may only carry out tasks in accordance with the exposition and authorized specifications.

#### **171.13 Duration of certificate**

- (a) A CNS facility certificate shall be renewed for a period of up to 3 years.
- (b) A CNS certificate remains in force until it expires, withdrawn, suspended, or revoked.

#### **171.15 Renewal of certificate**

- (a) An application for the renewal of a CNS facility certificate shall be submitted to ECAA.
- (b) Procedures for a CNS facility certificate renewal are the same as listed under 171.7 (Request for certificate).
- (c) The holder of a CNS facility certificate that expires shall promptly surrender the certificate to the ECAA.
- (d) The application shall be submitted to the ECAA before the expiration date by 30 days at least.

#### **171.17 Administration sanctions**

- (a) Penalties:
  - (1) ECAA may impose a penalty (according to the Civil Aviation Law N.28 item No. 155), or reduce some privileges to the certificate holder if:
    - (i) It finds that the certificate holder does not comply with the requirements of this Part and such holder failed to remedy such non-compliance within 60-days after receiving notice in writing from ECAA to do so;
    - (ii) Such action is necessary in the interest of safety;
    - (iii) Its inspector is prevented by the provider from carrying out a safety inspection when his report recommends such action; and

- (iv) The certificate holder failed to provide the facility in the required standard level, which is confirmed to ECAA by receiving reports from the users of the facility and proved by a legal investigation.
- (2) When proposing a penalty, ECAA will state the reasons for such action and will furnish them to the certificate holder.
- (b) Suspension of certificate:  
This is a subsequent procedure to impose a penalty:
  - (1) ECAA may suspend for a defined period, a CNS facility certificate issued under this Part if:
    - (i) Subject to item 171.17 Paragraph (a), ECAA is satisfied that the certificate holder still unable to remedy any of these non-compliant areas with the specified time frame of 60-days;
    - (ii) The investigation, in case of an accident, proves that it was caused due to the faulty procedures and/or the malfunction or failure of CNS equipment or system;
    - (iii) The certificate holder failed to perform the corrective action plan stated in the certificate in the exact period of time if so stated; and
    - (iv) Actions still necessary in the interest of aviation safety.
  - (2) When proposing a suspension, ECAA will state the reasons for such action and furnish them to the certificate holder.
  - (3) The certificate holder may appeal against such notice within 30-days of receipt.
  - (4) The appellant shall furnish to ECAA any documents, records, or other pertinent information supporting the appeal.
  - (5) ECAA may confirm, modify, or set aside the proposed suspension based on the appeal.
- (c) Revocation of certificate:  
This is a subsequent procedure to suspension:
  - (1) ECAA may permanently revoke a CNS certificate issued under this Part if:
    - (i) It is verified that the certificate holder will not be able to remedy non-compliant areas; or
    - (ii) The certificate holder stops providing the facility concerned without a convincing argument.
  - (2) ECAA has decided for the interest of safety to terminate facilities provided at this aerodrome.
  - (3) The Ministerial Order issued for the certificate holder is revoked.
  - (4) The revoked certificate cannot be renewed; it has to be reissued not less than one year after the revocation date.

#### **171.19 Withdrawal or change in level of facility**

- (a) Each holder of a CNS facility certificate who wishes to permanently withdraw from providing the service shall give the ECAA at least 90 days notice of the proposal and include in that notice a summary of factors considered in arriving at the decision to withdraw the facility.
- (b) Each holder of a CNS facility certificate who intends to permanently reduce the scope of air navigation Facilities shall provide to the ECAA a notice in advance of at least 60 days of the proposed reduction, and the reasons for it.

#### **171.21 Limited approval**

Considering the interest of navigation safety, ECAA may grant a provisional approval to an existing certificate holder to act as a substitute Communications, Navigation and Surveillance (CNS) facility provider in respect to a certificate that has been withdrawn, suspended or revoked under condition that the proposed operation can be safely conducted under the terms of limited approval.

#### **171.23 Transfer of service**

- (a) Each applicant for the grant of an air navigation facility certificate intending to resume responsibility for providing any CNS service an existing certificate holder, shall include with its application, full details of transitional arrangements endorsed by the air navigation facility managers of both organizations.
- (b) Each holder of a CNS facility certificate who will be the previous provider of the service shall not hinder the preparation and execution of transitional arrangements.

- (c) The transitional arrangement between both organizations shall be under the supervision of ECAA.

#### **171.25 Display of certificate**

- (a) Each certificate holder of a CNS unit shall display the certificate in a prominent place generally accessible to the public at the holder's principal place of business and, if a copy of the certificate is displayed, shall produce the original approval to an ECAA inspector if so requested by such inspector.
- (b) The facility manager shall ensure that only one certificate for a facility is current at any time.

#### **171.27 Reserved**

#### **171.29 Continued compliance**

- (a) Each holder of a CNS facility certificate shall:
  - (1) Hold at least one complete and current copy of the exposition for each facility listed in it, except that manuals relating to a particular location need only be held at principal locations and the unit concerned;
  - (2) Comply with all procedures and standards detailed in its exposition;
  - (3) Make each applicable part of its exposition available to personnel who require those parts to carry out their duties;
  - (4) Continue to meet the standards and comply with the requirements prescribed for certification under this Part;
  - (5) Notify the ECAA of any change of address for facility, telephone number, facsimile number, or electronic mail address required by a notification form within 28 days of the change; and
  - (6) Notify ECAA of any occurrence, which effects navigation safety.
- (b) The report shall be submitted to ECAA within 72 hours if any of the following occurrences happen:
  - (1) The CNS facility is operated only by one service channel.
  - (2) The air-conditioning of CNS facility station is malfunction.
  - (3) The malfunction of un-break power supply.
  - (4) The power supply cables are disconnected.
  - (5) Notification of accident and incident report.

#### **171.31 Contractual arrangements and trial technical testing**

- (a) No contracts shall be issued unless it fulfills minimum requirements of this Part.
- (b) Technical specifications of equipment for developing projects shall be submitted with the Statement Of compliance to the ECAA to ensure compliance with international standards.
- (c) The ECAA inspector or delegated representative has the right to attend and approve training courses, factory acceptance test or site acceptance test for CNS facilities.
- (d) A trial may be approved by the ECAA for a single period of no longer than 3 months, and upon further application in writing by the certificate holder, the trial can be extended by the ECAA for another single period of no longer than 3 months.
- (e) The ECAA may terminate a trial approved under this rule at any time.
- (f) All contracts for major maintenance must be approved by ECAA.

#### **171.33 Exemptions**

The ECAA may exempt, in writing, a certificate holder from complying with specific provisions of this Part only and where permitted by those provisions, after carrying out aeronautical studies, and determining the conditions and procedures that are necessary and shall be adopted by a certificate holder to ensure a level of safety equivalent to that established by the relevant standard or practice. An exemption is subject to the certificate holder complying with the conditions and procedures specified by the ECAA as being necessary in the interest of safety.

#### **171.35 ECAA Inspection Authority**

- (a) Each person holds a certificate under this part (or applied for such certificate) shall grant unrestricted and unlimited access for ECAA inspectors to inspect his personnel, facilities, equipment, documents and records to determine:

- (1) Eligibility to continue to hold his certificate.
- (2) Compliance with this ECAR part
- (b) Failure to comply with paragraph (a) above shall be a basis to suspend, withdraw or revoke any certificate issued under this part.

### **171.36 Through 39 Reserved**

#### **171.41 Personnel requirements**

- (a) An applicant for the grant of Communications, Navigation and Surveillance (CNS) facility certificate shall engage, employ or contract:
  - (1) A senior person identified as the Chairman who has the authority within the applicant's organization to ensure that all activities undertaken by the organization can be financed and carried out to meet applicable operational requirements, and in accordance with the requirements prescribed by this Part;
  - (2) A senior person or group of senior persons who are responsible for ensuring that the applicant's organization complies with the requirements of this Part. Such nominated person(s) shall be ultimately responsible to the Chairman; and
  - (3) Sufficient personnel to inspect, supervise, and maintain the facilities listed in the applicant's exposition according to the approved training.
- (b) The applicant shall:
  - (1) Establish a procedure to assess the competence of those personnel who are authorized to maintain any of the facilities listed in the applicant's exposition;
  - (2) Establish a procedure to maintain the competence of those authorized personnel;
  - (3) Provide those authorized personnel with written evidence of their authorization and privileges according to their approved training and experience as indicated in 171.63; and
  - (4) Ensure that authorized personnel only exercise the privileges of their authorization on the relevant facilities or equipment.

#### **171.43 Facility requirements**

- (a) Each applicant for the grant of Communications, Navigation and Surveillance (CNS) facility certificate shall establish procedures to ensure that:
  - (1) Each facility listed in their exposition:
    - (i) Is designed, installed and commissioned to meet the applicable operational specification according to manufacture technical manuals; and
    - (ii) Conforms to the applicable system characteristics and specification standards prescribed in ICAO Annex 10 or the relevant documents.
  - (2) Each facility listed in the applicant's exposition is installed with suitable power supplies and means to ensure continuity of operation appropriate to the needs of the operational service being supported;
  - (3) Each facility listed in the applicant's exposition is in accordance with the Communications, Navigation and Surveillance (CNS) facility security program required by 171.55 to minimize the risk of destruction, damage or interference with the operation of the facility; and
  - (4) Any critical site area of any facility listed in the applicant's exposition is:
    - (i) Clearly identified on the site facility drawings;
    - (ii) Physically protected by suitable signposts on the site; and
    - (iii) Protected by written agreements with the site owner, aerodrome operator and air traffic control unit as appropriate, to ensure that site restrictions are not infringed by buildings, fences, vehicles, machinery or aircraft.
- (b) The procedure shall ensure that there is no possible interference to any other operating facility and that appropriate information is forwarded to the Aeronautical Information Services (AIS) for the issue of a NOTAM or the publication of a supplement to the aeronautical information publication (AIP).

#### **171.45 Exposition**

- (a) An applicant for the grant of Communications, Navigation and Surveillance (CNS) facility certificate shall provide ECAA with an exposition containing:
  - (1) Facility information listed in the following table, as applicable:

1	Facility Name	
2	Facility location	
3	Facility ID Code	
4	Facility Status	
5	Facility Class	
6	Facility AIP reference	
7	Facility Function	
8	Date of <u>Site Acceptance</u>	
9	Facility Hours of Operation	
10	Facility User.	
11	Facility attendance State (Yes/No)	
12	Facility monitoring and control (Remote/Local)	
13	Facility ICAO Annexes Reference	
14	Facility Certification Date	

- (2) Factory acceptance tests and site acceptance tests for CNS facility or a copy of commissioning;
  - (3) ECAA directives;
  - (4) Facility technical specification and its compliance with ICAO references;
  - (5) Facility description in different levels:
    - (i) A geographical map indicating the location of the integrated system, if it is available;
    - (ii) Lay out for the equipment room;
    - (iii) Facility equipment block diagram and; and
    - (iv) List of all equipment in the facility with function, type model, date of installation.
  - (6) Maintenance policies and procedures and maintenance & operating instructions;
  - (7) List of test equipment and calibration check list if it is necessary (171.97);
  - (8) List of tools and tools checklist;
  - (9) Maintenance levels for facility (level 1: operation, level 2: Replacement fuses, switches, level 3: change cards or modules, level 4: change components level 5: upgrade and system modification);
  - (10) Approved agreements and contracts from ECAA:
    - (i) Agreements and contracts between the facilities if it is necessary;
    - (ii) Agreements and contracts with external agencies (e.g. military, electricity, communication...); and
    - (iii) Agreements with other non-electronic specialists (e.g. civil engineers for antenna masts) if it is necessary.
  - (11) Last version of software programs, and password level control;
  - (12) List of current spares parts available on site;
  - (13) Approved training programs for service providers and personnel assessment (171.63);
  - (14) Contingency plans (171.87);
  - (15) Notification of facility information (171.103);
  - (16) Facility Records:
    - (i) Statistic reports for facility malfunction (171.109); and
    - (ii) Accident and incident investigation and actions reports (171.107).
  - (17) Details of the staffing structure which include:
    - (i) Facility organization chart;
    - (ii) Facility employee database & job description; and
    - (iii) Facility employees' licenses & authorizations records.
  - (18) Administrative regulations;
  - (19) Safety regulations for attended and non-attended equipment;
  - (20) Security regulations for attended and non-attended equipment;
  - (21) Regulation for facility performance protection (e.g. service interference and; and obstacles restrictions).
- (b) Procedures to control amend and distribute the exposition; and
- (c) The applicant's exposition must be acceptable to the ECAA.



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**171.47 Documentation**

- (a) Each applicant for the grant of Communications, Navigation and Surveillance (CNS) facility certificate shall hold copies of the relevant equipment manuals, technical standards, and international standards and recommended practices (including Annex 10) and any other documents necessary for the provision and maintenance of the facilities listed in its exposition;
- (b) The applicant shall establish a procedure to control all the documentation required by paragraph (a). The procedure shall ensure that:
  - (1) All incoming documentation is reviewed, and directed as required, by authorized personnel;
  - (2) All documentation is reviewed by appropriate personnel;
  - (3) Current of the relevant documentation are available to personnel at all locations where they need access to such documentation for the provision and operation of facilities;
  - (4) All obsolete documentation is promptly removed from all points of issue or use;
  - (5) Any obsolete documents retained as archives are suitably identified as obsolete;
  - (6) Changes to documentation are reviewed and approved by appropriate personnel who shall have access to pertinent background information upon which to base their review and approval; and
  - (7) The current version of each item of documentation can be identified to preclude the use of out-of-date editions.

**171.49 Records**

- (a) Each applicant for the grant of Communications, Navigation and Surveillance (CNS) facility certificate shall establish systems and procedures to identify, collect, index, file, store, secure, maintain, access, and dispose of , in a manner to facilitate:
  - (1) Safe provision and operation of the facilities listed in their exposition; and
  - (2) Assistance with any accident or incident investigation.
- (b) The procedures shall ensure that:
  - (1) A record is kept for each facility in order to:
    - (i) Provide date of installation;
    - (ii) Document the performance of the facility; and
    - (iii) Provide a history of its maintenance and the periodic inspections and tests. The history shall be traceable to the person or persons responsible for each of the recorded activities.
  - (2) A record for each item of test equipment required for the measurement of critical performance parameters. The record shall provide a traceable history of the location, maintenance, and the calibration checks for such test equipment;
  - (3) A record of each facility malfunction recorded and investigated under the procedures required by 171.109 (facility malfunction). The record shall detail the nature of the malfunction, the findings of the investigation, the follow up corrective actions, or where applicable include a copy of the report forwarded to the certificate holder Chairman;
  - (4) A record of each internal quality assurance review of the applicant's organization carried out under the procedures required by 171.53 (internal quality management system);
  - (5) A record for each person who is authorized by the applicant to place facilities into operational service. The record shall include details of their experience, qualifications, training, competence assessments and current authorizations;
  - (6) The record can be either a paper or computer system or any combination of both and shall be stored in a safe way with regards to fire, food and theft;
  - (7) Paper system shall use robust material which can withstand normal handling and filling. The record shall legible throughout the required retention period;
  - (8) Computer systems used for maintenance records shall have at least one backup system which shall be updated;
  - (9) Each terminal is required to contain program safeguards against the ability of authorized personnel to alter the data base;

- (10) All facility records are retained for a period of at least 3 years unless a longer period is required to establish a performance history for a facility; and
- (11) The maintenance record shall be inspected and stored as required by the authority.

**171.51 Facility maintenance logbook**

- (a) Each applicant for the grant of Communications, Navigation and Surveillance (CNS) facility certificate shall establish procedures to ensure that a logbook, with sequentially numbered pages, is kept at each facility in their exposition and, where a facility has physically separate operations areas, at each such location within the facility;
- (b) The procedure shall ensure that:
  - (1) The logbook is maintained by the senior person, or the person on duty at a nominated operating position;
  - (2) The logbook is maintained throughout the operating hours of the facility;
  - (3) All entries include the date, time of entry and signature;
  - (4) Every page of the logbook must be signed by the facility manager or senior person;
  - (5) Logbook entries are:
    - (i) In chronological sequence and in ink;
    - (ii) Without erasure, defacement, or obliteration; and
    - (iii) Corrected by drawing a single line through the erroneous information and initialing the correction.
  - (6) Actual times of opening and closing facility are recorded in the logbook, together with the reason for every variation from published hours of service; and
  - (7) Logbooks are retained for a period of 3 years from the date of final entry.
- (c) The procedure shall ensure that the facility maintenance log:
  - (1) Contains sufficient information in the first pages of the logbook to identify:
    - (i) Facility information as described in 171.45(a)(1);
    - (ii) Precautions of operation or its reference number that included in the exposition; and
    - (iii) The services are being provided from the facility.
  - (2) Is retained for a period of 3 years from the date of first filing.

**171.53 Quality control management system**

- (a) Each applicant for the grant of Communications, Navigation and Surveillance (CNS) facility certificate shall establish an internal quality management system to ensure compliance with, and the adequacy of, the procedures required by this Part as approved by the ECAA;
- (b) The internal quality management system shall include:
  - (1) An inspection policy;
  - (2) Inspection procedures that are understood, implemented, and maintained at all levels of the organization;
  - (3) A procedure to ensure quality control indicators, including maintenance records, defect, interference and incident reports, and personnel and customer feedback, are monitored to implement required performance standards and to identify existing problems or potential causes of problems within the system;
  - (4) A procedure for corrective action specifying how to:
    - (i) Correct an existing problem;
    - (ii) Follow up a corrective action to ensure the action is effective; and
    - (iii) Measure the effectiveness of any corrective action taken.
    - (iv) Follow up a corrective action to ensure the action is efficiency; and
    - (v) Measure the effectiveness of any corrective action taken.
  - (5) A procedure for preventive action specifying how to manage a potential problem;

**171.55 Communications, Navigation and Surveillance (CNS) facility security program**

- (a) Each applicant for the grant of Communications, Navigation and Surveillance (CNS) facility certificate shall prepare a security program under ECAR Part 107;
- (b) Each security program shall specify the physical security requirements, practices, and procedures to be followed for the purposes of minimizing the risk of

- destruction of, damage to, or interference with the operation of, any facility operated by the applicant where such destruction, damage, or interference is likely to endanger the safety of aircraft; and
- (c) Without limiting the generality of paragraph (b), the security program shall specify such physical security requirements, practices, and procedures as may be necessary:
- (1) To ensure that entrances to permanent facilities operated by the applicant are subject to positive access control at all times, so as to prevent unauthorized entry; to protect personnel on duty;
  - (2) To be followed in the event of a bomb threat or other threat of violence against a facility; and
  - (3) To monitor unattended facility buildings to ensure that any intrusion or interference is detected.

#### **171.57 Coordination**

- (a) Each applicant for the grant of Communications, Navigation and Surveillance (CNS) facility certificate shall establish systems and procedures to ensure, where applicable, co-ordination between each facility listed in the applicant's exposition and the following agencies:
- (1) The holder of the air traffic service certificate issued under ECAR Part 172;
  - (2) Any holder of an aeronautical telecommunication facility certificate issued under ECAR Part 173;
  - (3) Any holder of an aeronautical information facility certificate issued under ECAR Part 174;
  - (4) The Egyptian Defense Force;
  - (5) Search and rescue authorities; and
  - (6) Telecommunication service authorities to coordinate:
    - (i) National telecommunication facilities;
    - (ii) International telecommunication facilities; and
    - (iii) Frequencies for aeronautical telecommunication and radio navigation services.
- (b) The applicant shall establish procedures to ensure facility letter of agreement is in place between each facility listed in the applicant's exposition and:
- (1) Entities providing services to the facility;
  - (2) Entities receiving services from the facility; and
  - (3) The entities in items 1 and 2 above may be internal within the service provider facilities or external to the service providers such as the electric power company or the telecommunication service company.

#### **171.59 Reserved**

## **SUBPART C**

### **Personnel and Facilities**

#### **171.61 Training**

- (a) Each applicant for the grant of a CNS facility maintenance certificate shall establish procedures acceptable to the ECAA and follow the approved training programs for CNS maintenance personnel as follows, as appropriate:

- (1) Phase 1:Initial training
- (2) Phase 2:Unit training
- (3) Phase 3:Continuation training
- (4) Phase 4:Development training

*The Manual on Competency-based Training of Air Traffic Safety Electronics Personnel (Doc 10057) contains guidance material on the design and development of an ATSEP training programme, including the training phases mentioned in paragraph (a).*

- (b) The requirements to obtain licenses and/or rating for personnel to maintain systems and equipment are listed in training manual approved from ECAA
- (c) Each applicant shall ensure that personnel giving instructions to the maintenance personnel are appropriately qualified.

#### **171.63 Training Courses and Curriculum requirements**

Each applicant for the grant of Communications, Navigation and Surveillance (CNS) facility certificate shall establish procedures to ensure that:

- (a) Each applicant shall submit the curriculum to the ECAA for approval, at least 15 days before conducting it for the first time .
- (b) The applicant is responsible to provide all facilities and information required to study the approval requested.
- (c) When preliminary acceptance to the proposed curriculum is granted, the applicant shall provide two copies of the training manuals pertaining to the curriculum along with all related official documents.
- (d) Upon fulfilling all demands of the ECAA, a coded approval number is issued to the curriculum, designating the applicant name, the curriculum level and its specification and, its training specifications and issue year, and revision number in this year.

#### **171.64 Training Facilities, equipment, and material requirements**

Each applicant for the grant of Communications, Navigation and Surveillance (CNS) facility certificate shall establish procedures to ensure that:

- (a) Classrooms:
- (1) The classroom shall be well lighted and provide the appropriate means to shadow natural light when using video tapes or similar devices;
  - (2) The classroom shall be well ventilated and be capable of maintaining a comfortable degree of temperature and humidity;
  - (3) The classroom shall be in a quite place, far from any environmental activities or noise;
  - (4) The classroom shall be of adequate size, and the number of trainees shall not exceed 18;
  - (5) The classroom shall be equipped with a convenient blackboard and equipped with all necessary training aids for each approved course;
  - (6) Each trainee shall have a chair and a table at least 60x80; and
  - (7) Each applicant shall submit, at least 60 days before conducting any training activities in a new classroom an application for approval of this classroom. The applicant shall allow the ECAA delegates to inspect the classroom, to insure compliance with specifications. Upon fulfilling the above steps a certificate of approval is issued to the classroom defining the limitations of approval if any. The ECAA shall be notified of any major change occurring to the classroom building or its installations or environment, at least 3 weeks before conducting any training activities within it.
- (b) Workshops or laboratory requirements:
- All suitable facilities must be arranged to assure proper separation from the working space, for parts, tools, materials, and similar articles;

### **171.65 Prevention of fatigue**

Each applicant for the grant of Communications, Navigation and Surveillance (CNS) facility certificate shall establish procedures to ensure that CNS facilities maintenance personnel are not subject to fatigue by ensuring that:

- (a) A maintenance personnel does not serve for more than 12 consecutive hours during a period of 24 consecutive hours;
- (b) At any time two maintenance personnel shall be present in a shift; and
- (c) In an emergency, maintenance personnel can perform duties for at maximum 24 consecutive hours each 7 consecutive days.

### **171.67 Facilities and equipment**

- (a) Each applicant for the grant of Communications, Navigation and Surveillance (CNS) facility certificate shall establish the facilities that are related to the any of the following air traffic services:
  - (1) Aerodrome control towers;
  - (2) Approach control;
  - (3) Area control centers;
  - (4) Navigation aid locations;
  - (5) Aerodrome AIS;
  - (6) AIS centers; and
  - (7) Dedicated training and assessment facilities.
- (b) An applicant for an aerodrome control tower service shall establish procedures to ensure that any aerodrome control tower includes any mobile tower listed in the applicant's exposition is:
  - (1) Constructed and situated to provide:
    - (i) The maximum practicable visibility of aerodrome traffic;
    - (i) Protection from glare and reflection; and
    - (iii) Protection from noise.
  - (2) Safeguarded from any development that would affect the requirements of paragraph (b) (1).
  - (3) Provided with:
    - (i) Toilet facilities that ensure the minimum possible interruption to CNS facility maintenance; and
    - (ii) Storage and preparation facilities for food and drink in the equipment or main power control room.
  - (4) Provided with equipment for two-way voice communication with:
    - (i) Aircraft, in or adjacent to airspace for which the applicant has responsibility; and
    - (ii) Aircraft, vehicles and persons, on, or adjacent to the maneuvering area.
  - (5) The following minimum equipment to be maintained is:
    - (i) A display system or systems designed to show the disposition of current and pending aerodrome traffic together with ancillary information for individual aircraft;
    - (ii) A power supply;
    - (iii) Clocks;
    - (iv) Logbook;
    - (v) Outside temperature indicator;
    - (vi) Signal lamp with green, red, and white functions;
    - (vii) Telephone communications;
    - (viii) Status monitors for approach and landing aids and any road or rail signaling equipment affecting the use of a runway;
    - (ix) Visibility and cloud height checkpoints;
    - (x) Voice and, where applicable, data recording equipment;
    - (xi) Wind direction and speed display;
    - (xii) An audible alerting alarm;
    - (xiii) An AFTN terminal or, where provided for in an ATS letter of agreement, an alternative means of reception and transmission of information normally conveyed by AFTN;
    - (xiv) If applicable, airfield lighting controls panel; and
    - (xv) Equipment necessary according to category of aerodrome.

- (c) The applicant shall establish procedures to ensure that the area control center, AIS centers, and approach control offices are:
  - (1) Provided with equipment enabling:
    - (i) To the fullest extent practical, two-way voice communication;
    - (ii) Where applicable, data communication with aircraft in, or adjacent to, airspace for which the applicant has responsibility.
  - (2) Provided with the following minimum equipment's:
    - (i) A display system or systems designed to show the disposition of current and pending flights together with ancillary information for individual aircraft;
    - (ii) A power supply;
    - (iii) Clocks;
    - (iv) Logbook;
    - (v) Status monitors as appropriate for navigation, approach, and landing aids;
    - (i) Telephone communications;
    - (ii) Voice recording equipment and, where applicable, data recording equipment;
    - (iii) An AFTN terminal;
    - (iv) For approach control operating positions, an ILS status monitor at the approach control or approach control radar operating position for the aerodrome concerned; and
    - (v) For approach control operating positions responsible for aircraft on final approach, or aircraft landing or taking-off, a wind direction and speed display fed from the same source as the corresponding equipment in the aerodrome control tower.
- (d) The applicant shall establish procedures to ensure that the area control center, AIS centers, and approach control offices are safeguarded against any installation of unessential electrical or electronic equipment that may affect the proper performance of the facility such as:
  - (1) Transmitters or radiating equipment that perform functions other than the intended facility function;
  - (2) Transmitters or power units that may affect the noise levels in the facility; and
  - (3) Lighting, heat producing sources or radio interference producing devices.
- (e) The applicant shall establish procedures to ensure that the air traffic services equipment required by Part 172, air traffics service certification, section 172.55 paragraphs (b) and (c) are satisfied.

**171.69 Through 171.79 Reserved**

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**SUBPART D**  
**Operating Requirements**

**171.81 Identification codes and call signs**

- (a) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate requiring an identification code for a radio navigation facility or call sign for a communications facility, shall submit to the ECAA the appropriate details; and
- (b) If such action is needed, the holder shall include the action in the facility exposition.

**171.83 Facility operation manuals**

- (a) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall provide an operation manual or system of manuals for the services listed in its exposition and complied by its personnel;
- (b) A holder certified to provide more than one facility, or a facility provides services from more than one location, may publish a core manual together with manual supplements specific to each service or location.

**171.85 Shift administration**

Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall establish a procedure to ensure that:

- (a) Adequate time is provided at the beginning and end of each shift, for the performance of those duties required:
  - (1) Before start of the shift; and
  - (2) After the end of the shift
- (b) A minimum of 10 minutes is provided for each transfer of duties at an operational facility.

**171.87 Contingency plan**

- (a) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall establish an approved contingency plan providing for the safe and orderly continuation of service in the event of a disruption, interruption, or temporary malfunction of facility equipment or related supporting service.
- (b) The plan shall be made on the equipment level, system level and operational level.

**171.89 Communication procedures**

Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall ensure that their procedures for operating the facilities listed in their exposition are in accordance with the applicable communication procedures prescribed in ICAO Annex 10, Volume II and ECAR Part 173.

**171.91 Operating and maintenance instructions**

Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall provide the operating and maintenance instructions of the manufacturer for each facility listed in their exposition, for the use and guidance of their personnel, operating and maintenance instructions of the manufacture for each facility listed in their exposition. The instructions shall be controlled by the documentation control procedures required by 171.47, and shall set out the requirements for operating and maintaining each facility. The instructions shall include a list of:

- (a) The critical performance parameters;
- (b) The test equipment required for the measurement of those parameters;
- (c) The check procedures for placing the facility into operational service; and
- (d) The inspection and test procedures for the operation and maintenance of the facility.

**171.93 Periodic inspection and testing**

- (a) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall establish procedures for the periodic inspection and testing of the facilities listed in their exposition to verify that they meet the applicable operational requirements and performance specifications. These procedures shall:
  - (1) Cover ground inspection, ground test and flights test where it is necessary according to the manufacturer technical manual;

- (2) Include the criteria for establishing or changing the period between the periodic tests for a facility. The criteria shall have regarded to:
  - (i) Any applicable information published by the International Civil Aviation Organization (ICAO), any other aeronautical authority or the manufacture;
  - (ii) Any applicable reliability data for the facility; and
  - (iii) The stability of the facility's operating environment;
- (3) Ensure that the basis of establishing or changing the period between the periodic tests for a facility are documented and approved by ECAA.
- (b) In addition, the applicant shall establish:
  - (1) An approved program of periodic ground inspections for each facility;
  - (2) An approved program of periodic ground tests for each facility;
  - (3) An approved program of periodic flight tests for each radio navigation aid unless the applicant can establish from the criteria in paragraph (a) (2) that periodic ground tests can replace the periodic flight tests for a facility without affecting the safety of air navigation.
- (c) The programs required by paragraph (b)(2) and (3) for the periodic ground and flight tests shall be based on the criteria in paragraph (a) (2) and shall specify the maximum period between the tests for each facility.
- (d) The program shall have procedure to check that all equipment in the facility are properly earthen in accordance with the Standard and Recommended Practices (SARPS ) of ICAO Annex 10 and the technical manual for equipment earthing to prevent electrical shocks and radio interference with the operating systems;
- (e) The program shall have procedure to check that the data control cables are protected with lightening arrestors;
- (f) The program shall have procedure to check that the antennas and masts of the facilities shall be properly protected against corrosion, lightening and interference;
- (g) The certificate holder shall notify ECAA of any radio navigation aid that is not subjected to periodic flight tests.

#### **171.95 Certification of facility performance**

Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall establish a procedure to ensure that no facility listed in their exposition is placed into operational service unless:

- (a) The person placing the facility into operational service is authorized and is assessed as competent under the procedures required by 171.41 (b);
- (b) The appropriate checks have been carried out to verify the performance of the facility under the procedures required by 171.93; and
- (c) The facility record has been completed in accordance with the procedures required by 171.49.

#### **171.97 Inspection measuring and test equipment**

- (a) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall ensure that appropriate inspection, measuring and test equipment is available for their personnel to maintain the safe operation of each facility listed in their exposition.
- (b) The applicant shall establish a procedure to control, calibrate and maintain all of the applicant's inspection, measuring and test equipment to ensure that each item of equipment has the precision and accuracy that is necessary for the measurements and tests to be performed.
- (c) The procedure shall ensure that each item of test equipment required for the measurement of critical performance parameters is:
  - (1) Calibrated before use or at prescribed intervals against certified equipment having a known valid relationship to nationally recognized standards. Where no such standards exist, the basis used for the calibration shall be documented. Records of such calibrations and the standards used shall be maintained in accordance with the procedures required by 171.49;
  - (2) Identified with a suitable indicator to show its calibration status;
  - (3) Controlled to:
    - (i) Safeguard against adjustments that would invalidate the calibration setting;
    - (ii) Ensure that the handling, preservation and storage are such that the accuracy and fitness for use is maintained.



- (d) Where hardware and software systems are used as an alternative form of facility performance testing, the functions of the systems shall be checked before being released for use in order to establish that they are capable of verifying the performance of the facility. These functions shall be checked at prescribed intervals. Records of these checks shall be maintained as evidence and verification of adequate performance of the test system.

#### **171.99 Deviations**

- (a) Subject to compliance with 171.103, the holder of Communications, Navigation and Surveillance (CNS) facility certificate may deviate from any requirement of this Part to meet an emergency situation if there is a need to take immediate action for the protection of life or property involving carriage by air.
- (b) A certificate holder who deviates from a requirement of this Part under paragraph (a) shall provide a written report to ECAA as soon as practicable, but in any event not later than 7 days after the emergency. The report shall cover the nature, the extent and the duration of the deviation.

#### **171.101 Limitations on certificate holder**

- (a) The holder of Communications, Navigation and Surveillance (CNS) facility certificate shall not operate a facility if there is any cause to suspect the integrity of the information being provided by the facility. A cause to suspect the integrity of the information being provided by a facility includes the infringement of any critical site area of the facility until performance checks on the facility verify that the infringement does not and will not affect the performance of the facility.
- (b) A certificate holder shall not operate a radio transmitting facility on an aeronautical radio frequency except pursuant to a written radio apparatus license granted by the Ministry of Information and Telecommunication subject to the provisions of ICAO Annex 10 Volume V.
- (c) Except where a deviation under 171.99 is required or a site test is carried out under the procedures required by 171.31 (b), a certificate holder shall not operate a facility unless:
  - (1) The facility is listed in the holder's exposition;
  - (2) The performance of the facility meets the applicable facility published information;
  - (3) The performance of the facility meets the applicable facility requirements in 171.95;
  - (4) Any integrity monitoring system for the facility is fully functional;
  - (5) All the periodic tests for the facility are completed in accordance with the programs established under 171.93(b) (2) and (3);
  - (6) The facility is included in the holder's airways security program, if the destruction, damage, or interference of the facility is likely to endanger the safety of an aircraft in flight;
  - (7) The provisions of the holder's airways security program for the facility are being complied with.

#### **171.103 Notification of facility information**

- (a) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall establish a procedure to notify the users of the facilities with the operational information for each facility.
- (b) The procedure shall ensure that:
  - (1) The operational information on any facility that supports an air traffic service or the Egyptian air navigation system is forwarded to an aeronautical information service (AIS) for publication in the country's aeronautical information publication (AIP);
  - (2) The users of a facility are notified without delay of any updates in the facility information that if updated, may affect the safety of air navigation. For those facilities published in the Egyptian AIP the information concerning any change to their information shall be forwarded to the aeronautical information service for the issue of a NOTAM if so required.

**171.105 Notification of facility status**

- (a) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall establish procedures to notify users of its facility of any changes in the operational status of each facility or service listed in the applicant's exposition.
- (b) The procedures shall ensure that:
  - (1) The change of status for each of the holder's units is forwarded to the holder of the air traffic service certificates under ECAR Part 172 and aeronautical information service certificate issued under ECAR Part 174 for ECAA AIP service; and
  - (2) The users of Communications, Navigation and Surveillance (CNS) facility are notified without delay of any change in operational status of the facility or service that may affect the safety of air navigation, and, except where the change is temporary in nature, information concerning any change in operational status of the facility is forwarded to the holder of the aeronautical information service certificate for the NOTAM service.

**171.107 Facility check after accident or incident**

- (a) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall establish a procedure to check and record the operating condition of any facility listed in their exposition that may have been used by an aircraft or an air traffic service involved in an accident or incident.
- (b) The procedure shall ensure that:
  - (1) The checks are carried out as soon as practicable after notification to the applicant's organization of such an accident or incident; and
  - (2) The record of the facility's operating condition as checked and the past recorded history are kept in a secure place for possible use by any subsequent investigation.

**171.109 Facility malfunctions**

- (a) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall establish a procedure to record, investigate, and rectify any detected or reported malfunction of any facility listed in their exposition.
- (b) The procedure shall ensure that a report is forwarded to ECAA whenever a facility malfunction investigation reveals that:
  - (1) The facility has been operating outside the allowable tolerances; or
  - (2) The facility had the potential to operate outside the allowable tolerance; or
  - (3) There appears to be a recurring cause for the facility malfunction reports.
- (c) The report required in paragraph (b) shall be forwarded within 7 days of malfunction being detected or reported and shall include full details of the malfunction, the findings of the investigation and the corrective action taken to prevent a recurrence.

**171.111 Changes to certificate holder's exposition**

- (a) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall ensure that their exposition is amended so as to remain a current description of the holder's organization and facilities.
- (b) The certificate holder shall ensure that any amendments made to the holder's exposition meet the applicable requirements of this Part;
- (c) The certificate holder shall provide ECAA with a copy of each amendment to the holder's exposition as soon as practicable before its incorporation into the exposition.
- (d) ECAA may prescribe conditions under which a certificate holder may operate during or following any of the changes specified under paragraph(c).
- (e) A certificate holder shall comply with any conditions prescribed under paragraph (d).
- (f) Where any of the changes referred to in this rule requires an amendment to the certificate, the certificate holder shall forward the certificate to ECAA as soon as possible.
- (g) The certificate holder shall make such amendments to the holder's exposition, as ECAA may consider necessary in the interest of aviation safety.

### **171.113 Information flow requirements**

- (a) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall establish procedures for the receipt of information on the following activities when the activity could affect air traffic services within the holder's area of responsibility:
  - (1) A technical supervisor shall be available to monitor the status of all en route facilities or receive them either through the air traffic control supervisor or through the facility technical staff;
  - (2) A Technical Supervisor shall be available to receive all status of all radio navigation aids facility and report the status to the AIS or to the ATC supervisor depending on the particular case; and
  - (3) A technical supervisor shall be available to receive all status reported at the airdromes and take necessary actions including reporting the status to the appropriate authorities.
- (b) The holder shall establish systems and procedures to ensure that each facility, appropriate to the applicant's intended area of responsibility, is kept informed of the operational status and the existence of temporary hazards of:
  - (1) All navigation aids in the system;
  - (2) All surveillance radar in the system;
  - (3) All air/ground and ground/ground communication facilities in the system;
  - (4) All automation facilities in the system; and
  - (5) All environmental facilities in the system.

### **171.115 Aeronautical telecommunication facilities**

Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall establish procedures to ensure that:

- (a) The International Standard and Recommended Practices of ICAO Annex 10 volume II, III and V as amended are complied with;
- (b) All radio communication services listed in the AIP of Cairo FIR are being served by physical facilities identified in the holder's exposition;
- (c) All radio equipment is fully redundant to ensure service reliability that are required by the system specifications;
- (d) All remote radio sites are easily accessible to the maintenance personnel to allow on time arrival for them in case of emergencies;
- (e) All voice switches and position control panels are maintained to guarantee continuity of service according to the specifications;
- (f) Fully uninterrupted power supply units are available at each separate radio site;
- (g) Availability of a bypass to the equipment providing the service in case a full failure of voice switching system should occur;
- (h) Maintain High Frequency (HF) aeronautical telecommunication facilities (selective calling systems) as an alternative means of communication to aircraft or as main means of communication to aircraft for areas that may not be covered by VHF A/G communications.
- (i) When two or more ATS frequencies are being used by a controller, consideration should be given to provide facilities to allow ATS and aircraft transmissions on any of the frequencies to be simultaneously retransmitted on the other frequencies in use thus permitting aircraft stations within range to hear all transmissions to and from the controller.
- (j) All aeronautical telecommunication stations, including end systems and intermediate systems of the aeronautical telecommunication network (ATN), shall be protected from unauthorized direct or remote access.
- (k) No contracts shall be issued with Satellite Service Provider unless it fulfills min requirements of Annex 10, Volume III, Chapter 4.
- (l) The VHF Air-ground Digital Link (VDL) requirements and system characteristics shall be according to Annex 10, Volume III, Chapter 6 and Volume V, chapter 4.
- (m) ATN communication services supporting ATN applications shall be according to Annex 10, Volume III, Part I Chapter 3, Chapter 8 and Volume II, Chapter 4.
- (n) Service via satellite for the dissemination of aeronautical information point-to-multipoint telecommunication service shall be based on full-time, non pre-imputable, protected services as defined in the relevant CCITT Recommendations.

- (o) Aeronautical stations shall maintain a continuous listening watch on VHF emergency channel 121.5 MHz during the hours of service of the units at which it is installed.

Note. — See Annex 10, Volume V, 4.1.3.1.1 for provisions related to the utilization of 121.5 MHz at aeronautical stations.

- (p) HF data link system requirements and system characteristics shall be according to Annex 10, Volume III, Chapter 11.
- (q) Air-Ground VHF Communication System Characteristics and requirements shall be according to Annex 10, Volume III, Part II, and Chapter 2.
- (r) HF Communication System / Single Sideband (SSB) Characteristics and requirements shall be according to Annex 10, Volume 3, Part II, Chapter 2, item 2.4.
- (s) The use of circuit switching and signaling to provide speech circuits to interconnect ATS units not interconnected by dedicated circuits shall be by agreement between the Administrations concerned.
- (t) The application of aeronautical speech circuit switching and signaling shall be made on the basis of regional air navigation agreements.
- (u) Technical provisions relating to international aeronautical speech circuit switching and signaling for ground-ground applications shall be according to Annex 10, Volume 3, Part II, and Chapter 4.
- (v) The geographical separation between VHF VOLMET stations shall be determined regionally and shall be such that operations free from harmful interference are secured throughout the protected service volume of each VOLMET station.

Note.— Guidance material on the interpretation of 4.1.4.7 is contained in the Handbook on Radio Frequency Spectrum Requirements for Civil Aviation including statement of approved ICAO policies (Doc 9718).

#### **171.117 Ground telecommunication facilities**

- (a) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall establish systems and procedures to communicate between the en route (area) control centers and remote air/ground communication stations or en route radar stations or military control centers. The systems and the procedures should be established and maintained to guarantee continuity of service according to the system specifications;
- (b) The applicant shall establish procedures to ensure that:
  - (1) All service interruptions to the ground telecommunication services are promptly reported and acted upon according to the standard corrective maintenance procedures;
  - (2) The standard preventive and periodic maintenance procedures are applied to the ground telecommunication facilities to minimize the probability of service interruption; and
  - (3) Alternative means to ground communications are identified in case of service interruption of the main means of ground communications. Alternative means of ground telecommunications could include direct connections from the Telephone Company, satellite communications, microwave links and HF single side band systems.

#### **171.119 Radio navigation aids facilities**

- (a) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall establish systems and procedures to:
  - (1) Ensure compliance with the International Standards and Recommended Practices of Annex 10 volume I chapters 2 for provisions and chapter 3 for the specification and volume V for frequency management and constructing and installation on operation in ECAR 139 and the ground and flight testing of ICAO standard facilities contained in Attachment C of Annex 10, volume I and in the Manual on Testing of Radio Navigation Aids (Doc 8071) of the following types of radio navigation facilities:
    - (i) Instrument landing system (ILS) CAT I and/or CAT II at aerodromes;

- (ii) VHF omni-directional radio range (VOR) for en route and terminal radio navigation services;
- (iii) Non directionnel radio bacon (NDB) for en route radio navigation;
- (iv) UHF distant measuring equipment (DME) for en route and terminal services; and
- (v) Application for GNSS should be considered in the near future.
- (2) Conform to the requirements of the critical and sensitive areas surrounding ILS installation as in attachment C of Annex 10, volume I;
- (3) Ensure that the minimum distance from the runway center line to holding position may need to be increased to avoid interference with radio navigation aids as in attachment of Annex 10, volume I;
- (4) Ensure that VOR sitting selection requirements for check-points:
  - (i) The signal strength of the nearby VOR has to be sufficient to ensure satisfactory operation of a typical aircraft VOR installation. In particular, full flag action (no flag showing) must be ensured. The check-points should, within the limits of operating convenience, be located away from buildings or other reflecting objects (fixed or moving) which are likely to degrade the accuracy or stability of the VOR signals;
  - (ii) The observed VOR bearing at any selected point should ideally be within plus or minus 1.5 degrees of the bearing accurately determined by survey or chart plotting; and

**Note:** The figure of plus or minus 1.5 degrees has no direct operational significance in that the observed bearing becomes the published bearing; however, where a larger difference is observed, there is some possibility of poor stability.

  - (iii) The VOR information at a selected point should be used operationally only if found to be consistently within plus or minus 2 degrees of the published bearing. The stability of the VOR information at a selected point should be checked periodically with a calibrated receiver to ensure that the plus or minus 2-degree tolerance is satisfied, irrespective of the orientation of the VOR receiving antenna; and

**Note:** The tolerance of plus or minus 2 degrees relates to the consistency of the information at the selected point and includes a small tolerance for the accuracy of the calibrated VOR receiver used in checking the point. The 2-degree figure does not relate to any figure for acceptance or rejection of an aircraft VOR installation, this being a matter for determination by ECAA and users in the light of the operation to be performed.

  - (iv) Checkpoints, which can satisfy the foregoing requirements, should be selected in consultation with the operators concerned. Provision of checkpoints in holding bays, at runway ends and in maintenance and loading areas, is usually desirable.
- (5) Ensure that each VOR checkpoint must be distinctively marked. This marking must include the VOR bearing which a pilot would observe on his aircraft instrument if his VOR installation were operating correctly;
- (6) Ensure that radio navigation aids shall be provided with suitable power supplies and mains to ensure continuity of service appropriate to the needs of the service provided; and
- (7) Ensure that the height of the ILS reference datum must be considered, when studying the location of a threshold as mentioned in Annex 10 volume 1 attachment C.
- (8) Ensure that At those locations where two separate ILS facilities serve opposite ends of a single runway and where a Facility Performance Category I — ILS is to be used for auto-coupled approaches and landings in visual conditions an interlock should ensure that only the localizer serving the approach direction in use radiates, providing the other localizer is not required for simultaneous operational use.
- (b) The procedures required by paragraph (a) (1) shall ensure that:
  - (1) All service interruptions to the radio navigation services are promptly reported and acted upon according to the standard corrective maintenance procedures. Notification for the navigation aid systems should take place through at least

- remote monitoring unit (RMU) Systems at the towers or the en route (area) centers;
- (2) The standard preventive and periodic maintenance procedures are applied to the radio navigation facilities to minimize the probability of service interruption; and
  - (3) Alternative means to radio navigation are identified in case of service interruption of the main radio navigation aids services:
    - (i) In case of ILS failures, normally an alternative means needed to take effect such as reducing the system from CAT II to CAT I unless failure is related to equipment. In this case a redundant system and efficient logistic support need to be maintained; and
    - (ii) In case of VOR failures, normally an alternative means may involve the use of overlapping VOR coverage or use of other operational means unless failure is related to the equipment. In this case a redundant system and efficient logistics support need to be maintained
  - (4) A list of no redundant (main equipment only) radio navigation aid facilities need to be prepared and reported to the head of the technical and operational supervisor to take appropriate operational measures in case of their failure
  - (5) In localities and along routes where conditions of traffic density and low visibility necessitate a ground based short-distance radio aid to navigation for the efficient exercises of air traffic control, or where such short-distance aid is required for the safe and efficient conduct of aircraft operations, the standard aid shall be the VHF omni directional radio range (VOR) of the continuous wave phase comparison type conforming to the standards contained in chapter 3.3.3.
- (c) Aerodrome control towers and units providing approach control service shall be provided without delay with information on the operational status of radio navigation aids essential for approach, landing and takeoff at the aerodrome(s).
- (d) It is permissible to replace non-visual aid with an alternative non-visual aid on the basis of regional air navigation agreement.

#### **171.121 Radar surveillance facilities**

- (a) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall establish systems and procedures to:
  - (1) Ensure compliance with the international standards and recommended practices of Annex 10 volume IV chapters 2 and 3 for the Secondary Surveillance Radar (SSR) systems; and
  - (2) Ensure that all systems are provided with monitoring facilities to ensure service continuity.
  - (3) The monopoles secondary surveillance radar (MSSR) shall be modified to the application of S-Mode.
  - (4) A precision approach radar system conforming to the standards contained in Annex 10 Volume 1 Chapter 3 should be installed and operated as a supplement to a non-visual aid.
- (b) The applicant shall establish a procedure to ensure that:
  - (1) All service interruptions to the radar surveillance services are promptly reported and acted upon according to the standard corrective maintenance procedures;
  - (2) The standard preventive and periodic maintenance procedures are applied to the radar surveillance services facilities to minimize the probability of service interruption;
  - (3) Alternative operational means to radar surveillance services are identified in case of service interruption of the main radar surveillance services facilities according to the ATC ECAR Part 172 and associated procedures;
  - (4) All radar services are provided in accordance with procedures published in document 4444 or Document 7030 (as applicable to the Middle East/Asia Region); and
  - (5) Full information is made available to air traffic control administration on:
    - (i) The nature and extent of the radar services provided; and
    - (ii) Any significant limitations regarding such radar service.

### **171.122 Multilateration/ADS-B surveillance System facilities**

- (a) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate that has multilateration surveillance systems shall establish systems and procedures to:
  - (1) Ensure compliance with the international standards and recommended practices of Annex 10 volume IV chapters 6 for the Multilateration (MLAT) systems as amended.
  - (2) Ensure that MLAT system used for air traffic surveillance shall be capable of determining aircraft position and identity.
- (b) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate that has Automatic Dependent Surveillance-Broadcast (ADS-B) receiver(s) shall establish systems and procedures to ensure compliance with the international standards and recommended practices of Annex 10 volume IV chapter 5 as amended.

### **171.123 Data automation facilities**

- (a) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall establish procedures to ensure that:
  - (1) All automation systems that serve the en route, the approach and the tower facilities are maintained according to the maintenance manual of the manufacturer of each system;
  - (2) The ATS message service of the ATS (air traffic services) message handling service (ATSMHS) application shall be used to exchange ATS messages between users over the aeronautical telecommunication network (ATN) internet;
  - (3) The inter-center communications (ICC) applications set shall be used to exchange ATS messages between air traffic service users over the ATN internet;
  - (4) When ATN applications and communication services are implemented, it shall be established according to Annex 10, volume III, Chapter3 Volume II, chapter 4.
  - (5) Accounting management. An ATN systems management facility to monitor users for use of network resources and to limit the use of those resources;
  - (6) Terminals staffed either by the technical or the operational supervisors continuously monitor the automation systems functions. Data monitored by the technical supervisor are normally complemented by the data monitored by the operational supervisor to form a complete data monitoring and control system of the facility;
  - (7) Controller-Pilot Data Link Communications (CPDLC) Application shall establish its procedure and requirements according to Annex 10, volume II, Chapter8.
- (b) The holder shall establish a procedure to ensure that:
  - (1) Inputs and outputs to the central processors of the automation system are properly interfaced with each other;
  - (2) All power supplies of the processor are redundant, properly adjusted and tested; and
  - (3) Ability to upload and download programs to the central processor in case of modifications in the system.

### **171.124 Advanced surface movement guidance and control system (A-SMGCS)**

- Each holder of a Communications, Navigation and Surveillance (CNS) facility certificate that has some form of SMGCS shall establish systems and procedures to:
- (a) Ensure compliance with the ICAO Document 9830 (Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual) as amended.
  - (b) Ensure compliance with the ECAR Part 139 (Certification and Operations: Land Airports Intended to Serve Commercial or Non-Commercial Aircraft Operations) regarding (A-SMGCS) as amended.
  - (c) Ensure compliance with the EAC Part No. 139-30 regarding the operation specifications of A-SMGCS as amended.

**171.125 Clocks and time recording devices**

- (a) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall establish procedures to ensure:
  - (1) Compliance with ECAR Part 172, regarding the clocks and time recording system of the ATC communications;
  - (2) Coordinated universal time devices that express time in hours and minutes of the 24-hour day beginning at 0000 UTC are available and properly maintained;
  - (3) Facility is checked as necessary to ensure the correct time within 5 seconds of UTC as determined by reference to a standard time station or GPS time standard.
- (b) Wherever data link communications are utilized, the holder shall establish a procedure to ensure that all clocks and time-recording devices be checked as necessary to ensure correct time to within 1 second of UTC.
- (c) The holder shall establish a procedure to ensure that the correct time, to the nearest half minute, is provided:
  - (1) In respect of any aerodrome control service or aerodrome AIS, to IFR aircraft prior to taxiing for take-off; and
  - (2) To any aircraft on request.

**171.127 Record of communication**

- (a) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall establish a procedure to ensure:
  - (1) Compliance with the international standards and recommended practices of Annex 10, volume II, section 3.5 regarding the recording system of the ATC communications, and
  - (2) Compliance with ECAR Part 172, regarding the recording system of the ATC communications.
- (b) The holder shall establish a procedure to ensure:
  - (1) The recording systems capacity and quality are according to the international standards, and
  - (2) The recording system maintenance and recording tapes handling system is in accordance to the best international practices.

**171.129 Aeronautical radio frequency spectrum utilization**

- (a) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall establish procedures to ensure:
  - (1) Compliance with the international standards and recommended practices of Annex 10 volume V chapters 2 and 3 for the aeronautical radio frequency spectrum utilization;
  - (2) Compliance with frequency allocations of the navigation aids according to Annex 10 volume I and V;
  - (3) Compliance with frequency allocations of the aeronautical telecommunications spectrum (VHF and UHF) according to Annex 10 volume V; and
  - (4) Compliance with frequency allocations of surveillance radar contained in Annex 10 Volume I.
- (b) The applicant shall establish a procedure to ensure:
  - (1) Frequencies allocated for services outside those in items (a) 1 through 4 above are coordinated with the Egyptian National Frequency coordination board, and
  - (2) Compliance with frequency allocation protection procedures contained in Annex 10 volume V attachments A, B and C and Volume II Part 2 regarding VHF frequencies.

**171.131 Environmental facilities**

- (a) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall establish procedures to ensure that:



- (1) All power supply system's CNS facilities shall have a main feed power and UPS system;
- (2) The power supply switchover time for CNS facilities shall comply with the following table:

Type of runway	Aids requiring power	Maximum Switch – over times ( seconds )
Instrument approach	SRE	15
	VOR	15
	NDB	15
	D/F facility	15
	<u>DME</u>	<u>15</u>
Precision approach, Category I	ILS Localizer	10
	ILS glide path	10
	<u>DME</u>	<u>10</u>
	ILS middle maker	10
	ILS outer maker	10
	PAR	10
Precision approach, Category II	ILS localizer	0
	ILS glide path	0
	<u>DME</u>	<u>0</u>
	ILS inner maker	1
	ILS middle maker	1
	ILS outer maker	10
Precision approach, Category III	(same as Category II)	(same as Category II)

- (3) The power supply voltage stability shall comply with the manufacturer of the specific equipment specifications;
  - (4) All CNS facilities equipment rooms environmental condition including room temperature and humidity are within the recommended values by the specific CNS equipment manufacturer;
  - (5) All CNS facilities equipment rooms are shielded and insulated against leakage of air and dust. All exit doors and windows shall be closed to ensure the environmental conditions meet the requirements of paragraph 171.131; and
  - (6) All CNS facilities are provided by a diesel powered electrical generators even when the facility is supplied by the commercial electric power. In the latter case, the diesel powered electrical generator is considered stand-by source of power.
- (b) Each holder shall establish a procedure to ensure that:
- (1) All water supply is adequate to provide the water required for fire fighting equipment and other purposes by ensuring proper operation of water pumps; and
  - (2) All ventilation systems in the CNS facilities are maintained according to the general standards.
- (c) The holder shall establish procedures to ensure that:
- (1) All services interruptions to the environmental facilities are promptly reported and acted upon according to the standard corrective maintenance procedures;
  - (2) The standard preventive and periodic maintenance procedure are applied to the environmental facilities to minimize the probability of service interruption;
  - (3) Alternative means to environmental facilities are identified in case of service interruption of the main means of environmental facilities.
  - (4) Each holder of environmental facility certificate shall establish systems and procedures to communicate between environmental facilities.

**171.133 Protection of facilities from radio interference and structural obstacles**

- (a) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall establish procedures to ensure that:
- (1) All radio navigation aids are protected from radio frequency interference in accordance with ICAO Annex 10 volume I recommendations 3.1.4;
  - (2) All aeronautical telecommunications facilities are protected from radio frequency interference in accordance to the following procedures:
    - (i) Where the protection heights determined are less than that operationally desirable, separation between facilities operating on the same frequency should not be less than that necessary to ensure that an aircraft at the limit of the functional service range and the operationally desirable protection height of one facility does not come above the radio horizon with respect to adjacent facilities.
    - (ii) The problem of inter-State interference on frequencies allotted worldwide or on a regional basis to national services, should be resolved by consultation between the administrations concerned.
    - (iii) For ground VHF facilities which provide service beyond the radio horizon, any spurious or harmonic radiation outside the band  $\pm 250$  kHz from the assigned carrier frequency should not exceed an effective radiated power of 1 mW in any azimuth.
  - (3) No radio interfering devices shall be established in the proximity of the CNS facilities utilizing radio reception without prior approval from ECAA.
- (b) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall establish procedures to ensure that all radio navigation aids systems, radio telecommunication systems and radar systems that are using transmit or receive antennas shall not be obstructed by buildings towers structures that would impact their performance. The ICAO Annex 17 recommendations on rules for structural obstacle avoidance should be followed.

**171.135 Safety management system**

A certificate holder, who is certified under this part, shall show a complete compliance with ECAR Part 19, by establishing a safety management system that is acceptable to the ECAA, maintaining it, and completing its implementation as per the chronology mentioned in this regulation.

**171.137 Reporting service disruptions**

- (a) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall establish procedures to:
- (1) Advise the ECAA of any planned disruption of equipment that will result in disruption of air traffic services that could have an impact on safety;
  - (2) Report to ECAA within 48 hours of the occurrence, the circumstances surrounding any unplanned disruption of equipment resulting disruption of air traffic services when the disruption affected, or could have affected, the safety of air traffic including development of a list of such disruptions of equipment that are reportable. All other disruptions that are not affecting the continuation of air traffic services are reportable internally only; and
  - (3) Investigate any unplanned disruption to the provision of air traffic services and send a report of the investigation to ECAA.
- (b) Disruptions reportable under paragraph (a) shall include, but are not limited to, any:
- (1) Any interruption, of greater than 10 minutes, to the normal provision of an air traffic service;
  - (2) Any interference on the air/ground telecommunications channel that may affect the service greater than 10 minutes;

- (3) Failure of any radar coverage to areas that are declared as covered in the Cairo FIR AIP for greater than 10 minutes;
- (4) Failure of any radio navigation aids covered by Cairo FIR AIP for more than 10 minutes;
- (5) Routine maintenance of equipment that will have impact on the service when service brought off air;
- (6) New installations or additions on established services that require the service to be off-air; and
- (7) Any services that affect the air traffic services without having a contingency plan for operation.

#### **171.139 Reporting unsafe conditions**

- (a) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall establish a policy encouraging the reporting of unsafe conditions or practices observed by facility personnel;
- (b) Shift personnel shall have a checklist to report at the beginning of each shift the conditions of equipment in the facility where unsafe condition exists. Unsafe conditions reportable under paragraph (a) may include, but are not limited to:
  - (1) Radar signal of fixed targets are not present on the screen;
  - (2) Unstable performance of navigation aid;
  - (3) Simultaneous failure of radar and voice signals;
  - (4) Failure of air conditioning of the facility to operate;
  - (5) Failure of the UPS to function when the main power supply is interrupted;
  - (6) Persistent power failures without adequate alarms or failure of UPS systems to function in case of power failure;
  - (7) Persistent failures of main or standby equipment in the facility;
  - (8) Problems with shift administration;
  - (9) Failure to comply with Communications, Navigation and Surveillance (CNS) Facility instructions;
  - (10) Significant equipment reading deviations; and
  - (11) Procedural errors or inconsistencies that may affect the safety of air navigation services.

#### **171.141 Operation of facility for conducting temporary tests**

- (a) Each holder of Communications, Navigation and Surveillance (CNS) facility certificate shall establish a procedure for the operation of the facility for conducting temporary test to:
  - (1) Advise ECAA of a plan to conduct the temporary test;
  - (2) Include the time frame for conducting the test;
  - (3) The plan shall include the type and class of the facility that the test will be conducted;
  - (4) The plan shall indicate the purpose of the test, and
- (b) The holder of Communications, Navigation and Surveillance (CNS) facility certificate shall not operate the facility for temporary tests unless the ECAA approval is obtained.