

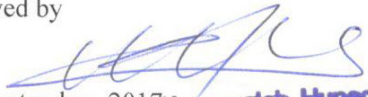
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The Air Navigation Regulation Directorate has issued this guidance material to be used by ANSP to prepare procedure manuals and other working documents for implementation of ICAO SARPS and National Regulations.

It is important to note that this guidance material improve the safety of air navigation services within Ethiopian air space .

The Director General of Ethiopian Civil Aviation Authority has here by approved this guidance material on September 18,2017 to be used as a guidance to air navigation services provider..

Approved by



Date September, 2017

Wosenyetch Hunegnaw (Col.)
Director General



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CHAPTER ONE
AIR TRAFFIC SERVICES

1) GENERAL REQUIREMENTS FOR ATS PROVIDER

1.1 MANUAL OF OPERATIONS

1.1.1 Air Traffic Service providers shall develop and provide its facilities with the approved operations manual in conformance with ECAA relevant regulatory standards.

1.2 STAFFING AND TRAINING

1.2.1 Service providers shall develop policies and procedures in the selection, hiring and retention of qualified and experienced technical staff.

1.2.2 The service provider responsible for the provision of Air Traffic Services shall

1.2.2.1 Hold copies of the relevant technical manuals, and all other documents, necessary for the provision of the services in each operational center.

1.2.2.2 Have operational and administrative manuals for compliance by its personnel.

1.2.2.3 Ensure that relevant regulatory standards/publications, operation manuals and ICAO documents are readily available to technical staff.

1.2.2.4 Establish a procedure to control/update all above documents.

1.2.3 Service providers shall ensure that their technical staffs are appropriately trained by establishing training programmes including initial, recurrent, specialized and refresher trainings.

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1.2.4 Service providers shall adopt a system for review the competency / proficiency of its technical personnel whenever new equipment, procedures, and updated communications are implemented.

1.2.5 The service provider responsible for the provision of Air Traffic Services shall adopt policies and procedures on human factors principles with regard to Human Centered Automation, Situational Awareness and Managing errors, etc as per the guidelines provided on human factors principles.

1.3 RECORD KEEPING AND DOCUMENTATION

1.3.1 Service providers shall establish a system for the recording and retention of data. Records shall include but not limited to:

- a) ATS data;
- b) Procedure design documentation;

1.3.2 Service providers shall establish mechanism that ensures reports and personnel records are maintained and updated and shall include:

- a) Personnel qualification and experience;
- b) Job descriptions;
- c) Training reports and training records of all members technical staff and
- d) Internal and external audit reports;

1.4 ACCESS TO ATM, CNS AND AERODROME FACILITIES

1.4.1 Safety Oversight Auditors/Inspectors in the exercise of their functions shall have full access to ATM, CNS and Aerodrome facilities to:

- a) Verify the safety level of the service/operation/facility.

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- b) Inspect and conduct tests on their facilities, equipment, services or operating procedures, inspect their documents and records, and verify their Safety Management System as applicable for the purpose of aviation safety; and
- c) Any part of their facilities, equipment, records, and documentation for the purpose referred to in paragraph (a) and (b) above.

1.5 SAFETY REQUIREMENTS FOR ATS PROVIDER

1.5.1 Requirement for read-back of safety related parts and relevant information of ATC clearances and instructions

- a) ATS service provider shall ensure that read-back requirements in accordance with Part 14. 3.7.3.1 - ECAARS.

1.5.2 Requirements for the control of movement of persons or vehicles on the maneuvering area of the aerodrome

- a) ATS service provider shall ensure that the procedures for the control of persons or vehicles on the maneuvering area of the aerodrome are established and implemented

1.5.3 Requirements for coordination, communication and information for service provider.

- a) The Service providers shall ensure that policies and procedures are established and implemented for coordination with neighboring state and other internal Air Traffic Control Units.

1.6 Service providers shall ensure that ATC contingency procedures are established for;

- a) Radio communication contingencies
- b) Emergency separation
- c) Short-term conflict alert (STCA)

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d) Minimum safe altitude (MSAW)

1.7 Requirement for ATS system capacity

1.7.1 ATS provider shall establish and implement policy and procedures in determining the capacity of ATS system including the required number of ATS staff to ensure the provision of adequate ATS system.

1.8 The service provider responsible for the provision of Air Traffic Services shall establish and implement monitoring mechanisms for RVSM.

1.9 The service provider responsible for the provision of Air Traffic Services shall establish and implement to verify that:

- a) aircraft are approved for operation in RVSM airspace, and
- b) the information is exchanged with the Regional Monitoring Agency (RMA) on a regular basis.

1.10 The service provider responsible for the provision of Air Traffic Services shall have a procedure regarding,

- a) Unlawful Interference
- b) Interception of Civil Aircraft
- c) Air Ground Radio Communication Failure

1.11 The service provider responsible for the provision of Air Traffic Services shall have following Air Traffic Services data recording retention logbooks

- a) Daily traffic movement record format
- b) Duty roster
- c) Emergency logbook
- d) Facility logbook
- e) Flight progress strip message
- f) Incident log book

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- g) Operational logbook
- h) Search and rescue logbook
- i) Suggestion logbook
- j) Voice record

1.12 OPERATIONAL REQUIREMENTS

- 1.12.1 The service provider responsible for the provision of Air Traffic services shall establish procedures to ensure that, where radar is used to support the provision of an Air Traffic Services.
- 1.12.2 The service provider responsible for the provision of Air Traffic services shall establish systems and procedures to ensure that the standard radio telephony procedures and Communication procedures.
- 1.12.3 The service provider responsible for the provision of Air Traffic services shall establish procedures for the acceptance and auctioning of flight plans.
- 1.12.4 The service provider responsible for the provision of Air Traffic services shall establish procedures to ensure that separation between aircraft shall be applied.
- 1.12.5 The service provider responsible for the provision of Air Traffic services shall establish procedures to ensure Standard Phraseology used in the provision of Air Traffic Services.
- 1.12.6 The service provider responsible for the provision of Air Traffic services shall establish procedures to follow after a serious incident or accident acceptable to the Director General of Civil Aviation.

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1.13 RUNWAY SAFETY PROGRAMME

1.13.1 ECAA shall establish at the national level tasked with the implementation of the State Runway Safety Programme, including education and awareness, guidance and assistance to Local Runway Safety Teams, among others. The Runway Safety Office shall be ultimately responsible for the runway safety initiatives throughout the civil aviation community. The unit shall be headed by the Runway Safety Programme Manager (RSPM) who will be appointed by the Director General.

1.13.2 A runway incursion prevention programme should start with the establishment of runway safety teams at individual aerodromes. The primary role of a local runway safety team, which may be coordinated by a central authority, should be to develop an action plan for runway safety, advice management as appropriate on potential runway incursion issues and recommend strategies for hazard removal and mitigation of the residual risk. These strategies may be developed based on local occurrences or combined with information collected elsewhere.

1.13.3 The Air Traffic Services provider shall establish runway safety programmes to enhance runway safety using collaborative approach that involves; regulators, aircraft operators, aerodrome operator and air navigation service provider.



1.13.4 The implementation of runway safety programmes aim to remove hazards and minimize the residual risk of runway incursions and to reduce active failures and the severity of their consequences. the principles of safety management systems (SMS) should be used to mitigate or eliminate the hazardous factors.

1.13.5 Runway incursions require the collaboration of air traffic controllers, pilots, vehicle drivers and aerodrome management.

1.14 The service provider responsible for the provision of Air Traffic services shall establish the following minimum equipments for aerodrome control tower :-

1.14.1 a display system or systems designed to show the disposition of current and pending aerodrome traffic together with auxiliary information for individual aircraft;

1.14.2 appropriate and current maps and charts;

1.14.3 binoculars;

1.14.4 clocks;

1.14.5 Altimeter setting indicator*

1.14.6 signal lamp with green, red, and white functions;

1.14.7 direct telephone communications;

1.14.8 extension telephone communications*

1.14.9 **walkie-talkie** (a hand-held, portable, two-way radio transceiver) *

1.14.10 voice data recording equipment;

1.14.11 wind direction and wind speed display;

1.14.12 an audible emergency alerting system

1.14.13 means of reception and transmission of information normally conveyed by AMHS *



- 1.14.14 Nav. aid (s) monitor panel*
- 1.14.15 airfield lighting controls panel
- 1.14.16 Intercom
- 1.14.17 Back-up power
- 1.14.18 Fire extinguishers
- 1.14.19 Sound-absorbing coverings (floor/wall) *
- 1.14.20 Shades*
- 1.14.21 Desks/consoles/shelves*

* Optional for domestic airports

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CHAPTER TWO

2. SAFETY MANAGEMENT SYSTEM

- 2.1 A service provider shall have, and put into effect, a safety management system acceptable to ECAA that includes the policies, procedures, and practices necessary in the safe provision of air traffic services.
- 2.2 The service provider shall conduct regular reviews of its safety management system and shall take corrective action/s as necessary to ensure that it operates properly.
- 2.3 The service provider’s SMS shall ensure that safety assessment is carried out for any significant safety-related change to ATM system.
- 2.4 The service provider’s SMS shall ensure that safety reviews are being conducted regularly by appropriately qualified personnel.
- 2.5 The Service provider shall ensure that a system for reporting air traffic incidents is established and implemented.
- 2.6 Service providers shall establish and implement a runway safety programme commensurate to the size and complexity of its organization
- 2.7 Applicability and acceptance
 - 2.7.1 The service provider shall have in place a safety management system (SMS) acceptable to ECAA that, as a minimum:
 - 2.7.2 identifies safety hazards;
 - 2.7.3 ensures the implementation of remedial action necessary to maintain agreed safety performance;

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- 2.7.4 provides for continuous monitoring and regular assessment of safety performance; and
- 2.7.5 aims at a continuous improvement of the overall performance of the safety management system
- 2.7.6 In order to be acceptable to the ECAA, a service provider’s SMS shall meet the requirements set forth in this regulation.

2.8 General safety requirements

- 2.8.1 A service provider shall define the organization’s safety policy.
- 2.8.2 The safety policy shall be signed by the Accountable Executive of the organization.
- 2.8.3 The safety policy shall include the responsibilities of management and employees with respect to the safety performance of the SMS.
- 2.8.4 The safety policy shall include a clear statement about the provision of the necessary for its implementation.
- 2.8.5 The safety policy shall be communicated, with visible endorsement, throughout the organization.
- 2.8.6 The safety policy shall also include, *inter alia*:
 - 2.8.6.1 A commitment to continual improvement in the level of safety;
 - 2.8.6.2 The hazard reporting procedures and
 - 2.8.6.3 The conditions under which disciplinary action would be not applicable following hazard reporting by employees.

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2.8.6 The safety policy shall be in accordance with all applicable legal requirements and international standards, best industry practices and shall reflect organizational commitments regarding safety.

2.8.7 The safety policy shall be reviewed periodically to ensure it remains relevant and appropriate to the organization.

2.8.6 A service provider shall establish safety objectives for the SMS.

2.8.7 The safety objectives should be linked to the safety performance indicators, safety performance targets and action plans of the service provider’s SMS.

2.9 A service provider shall identify an Accountable Executive to be responsible and accountable on behalf of the service provider for meeting the requirements of this regulation. The Accountable Executive shall be a single, identifiable person who, irrespective of other functions, shall have ultimate responsibility and accountability, on behalf of the organization, for the implementation and maintenance of the SMS and Accountable Executive shall have:

2.9.1 *Full control of the human resources required for the operations authorized to be conducted under the operations certificate;*

2.9.2 *Full control of the financial resources required for the operations authorized to be conducted under the operations certified;*

2.9.3 *Final authority over operations authorized to be conducted under the operations certify*

2.9.4 *Direct responsibility for the conduct of the organization's affairs; and*

2.9.5 *Final responsibility for all safety issues.*

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- 2.10 A service provider shall establish the necessary organizational arrangements for the Implementation of adherence to and maintenance of the organization's SMS.
- 2.11 A service provider shall identify the safety accountabilities, responsibilities and authorities of all members of management as well as of all employees, irrespective of other responsibilities.
- 2.12 Safety-related accountabilities, responsibilities and authorities shall be defined, documented and communicated throughout the organization.
- 2.13 A service provider shall identify someone from management to be the safety manager, the individual and focal point responsible for the implementation and maintenance of an effective SMS.
- 2.14 The safety manager shall inter alia:
 - 2.14.1 Ensure that processes needed for the SMS are developed, implemented adhered to and maintained;
 - 2.14.2 Report to the Accountable Executive on the performance of the SMS and on any need for improvement and
 - 2.14.3 Ensure safety promotion throughout the organization.
- 2.15 A service provider shall ensure its emergency response plan is properly coordinated with the emergency response plans of those originations it must interface with during the provision of its services. The coordination of the emergency response plan shall include, inter alia, the.
 - 2.15.1 *delegation of emergency authority;*
 - 2.15.2 *assignment of emergency responsibilities during the coordinated activities;*
 - 2.15.3 *coordination of efforts to cope with the emergency; and*
 - 2.15.4 *Compatibility with other emergency response Plans of other organizations.*
- 2.16 A service provider shall develop and maintain SMS documentation to describe:



2.16.1 the safety policy and objectives;

2.16.2 the SMS requirements;

2.16.3 the SMS processes and procedures

2.16.4 the accountabilities, responsibilities and authorities for Processes and procedures, and

2.16.5 The SMS outputs.

2.17 A service provider shall, as part of the SMS documentation, complete a gap analysis to develop, adhere and maintain an SMS implementation plan the plan shall include the following

2.17.1 Safety policy and objectives;

2.17.2 System description;

2.17.3 Gap analysis;

2.17.4 SMS components;

2.17.5 Safety roles and responsibilities

2.17.6 Hazard reporting policy;

2.17.7 Means of employee involvement;

2.17.8 Safety performance measurement;

2.17.9 Safety training;

2.17.10 Safety communication; and

2.17.11 Management review of safety performance.

2.18 The safety management systems manual (SMSM), shall document all aspects of the SMS, and its contents shall include the following:

2.18.1 Scope of the safety management system,

2.18.2 Safety policy and objectives,

2.18.3 Safety accountabilities;

2.18.4 Key safety personnel;

2.18.5 Documentation control procedures;

2.18.6 Coordination of emergency response planning;

2.18.7 Hazard identification and safety risk management schemes;

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- 2.18.8 Safety performance monitoring,
- 2.18.9 Safety auditing,
- 2.18.10 Procedures for the management of change,
- 2.18.11 Safety promotion, and
- 2.18.12 Control of contracted activities

2.19 A service provider shall develop and maintain safety data collection and processing systems (SDCPS) that provide for the identification of hazards and the analysis, assessment and mitigation of safety risks. The SDCPS shall include reactive, proactive and predictive methods of safety data collection.

2.19.1 A service provider shall develop and maintain formal means for effectively collecting, recording, acting on and generating feedback about hazards in operations, which combine reactive, proactive and predictive methods of safety data collection. Formal means of safety data collection shall include mandatory, voluntary and confidential reporting systems.

2.19.2 The hazard identification process shall include the following steps

- ❖ *reporting of hazards, events or safety concerns,*
- ❖ *collection and storage of safety data;*
- ❖ *analysis of the safety data; and*
- ❖ *distribution of the safety information distilled from the safety data*

2.20 A service provider shall develop and maintain a formal process that ensures analysis, assessment and control of the safety risks of the consequences of hazards during the Provision of its services. Safety performance monitoring and measurement means shall include the following

- 2.20.1 hazard reporting systems,
- 2.20.2 safety adults,
- 2.20.3 safety surveys,

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2.20.4 *safety reviews and*

2.20.5 *Internal safety investigations.*

2.21 *A service provider shall, as part of the SMS safety assurance activities, develop and maintain formal processes to identify the causes of substandard performance of the SMS, determine the implications on its operations, and rectify situations involving substandard performance in order to ensure continuous improvement of the SMS. Continuous improvement of the service provider's SMS shall include:*

2.21.1 *proactive and reactive evaluations of facilities, equipment, documentation and procedures, to verify the effectiveness of strategies for control of safety risks; and*

2.21.2 *Predictive evaluation of the individual's performance, to verify the fulfillment of safety responsibilities.*

2.22 *A service provider shall, as part of its safety promotion activities, develop and maintain a safety training programme that ensures the personnel are trained and competent to perform their SMS duties. The scope of the safety training shall be appropriate to the individual's involvement in the SMS and the Accountable Executive shall receive safety awareness training regarding*

2.22.1 *Safety policy and objectives;*

2.22.2 *SMS roles and responsibilities;*

2.22.3 *SMS standards, and*


2.22.4 *Safety assurance*

2.23 *A service provider shall, as part of its safety promotion activities, develop and maintain formal means for safety communication, to:*

2.23.1 *ensure that all staff are fully aware of the SMS,*

2.23.2 *convey safety-critical information;*

2.23.3 *explain why particular safety actions are taken;*

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2.23.4 explain why safety procedures are introduced or changed; and

2.23.5 convey generic safety information

2.24 IMPLEMENTATION OF THE SMS ENCOMPASSES FOUR PHASES

❖ Phase I

2.24.1 Planning should provide a blueprint on how the SMS requirements will be met and integrated into the organization's work activities, and an accountability framework for the implementation of the SMS:

- ❖ Identify the Accountable Executive and the safety accountabilities of managers,
- ❖ identify the person (or planning group) within the organization responsible for implementing the SMS
- ❖ Describe the system (ATOS, air operators, AMOS, organizations responsible for type design and/or manufacture of aircraft, ATC service providers, certified aerodromes);
- ❖ Conduct a gap analysis of the organization's existing resources compared with the national and international requirements for establishing an SMS;
- ❖ Develop an SMS implementation plan that explains how the organization will implement the SMS on the basis of national requirement and international SARPS, the system description and the results of the gap analysis,
- ❖ Develop documentation relevant to safety policy and objectives; and
- ❖ Develop and establish means for safety communication.

Phase II

2.24.2 Reactive processes should put into practice those elements of the SMS implementation plan that refer to safety risk management based on reactive processes hazard identification and safety risk management using reactive processes and training relevant to:

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- ❖ SMS implementation plan components and safety risk management (reactive processes)
- ❖ documentation relevant to SMS implementation plan components; and safety risk management (reactive processes)

Phase III

2.24.3 Proactive and predictive processes should put into practice those elements of the SMS implementation plan that refer to safety risk management based on proactive and predictive processes:

- ❖ hazard identification and safety risk management using proactive and predictive processes;
- ❖ training relevant to:
- ❖ SMS implantation plan components; and
- ❖ Safety risk management (proactive and predictive processes).
- ❖ documentation relevant to:
- ❖ SMS implementation plan components; and
- ❖ Safety risk management (proactive and predictive processes).

Phase IV

2.24.4 Operational safety assurance should put into practice operational safety assurance:

- ❖ development of an agreement on safety performance indicators and safety performance targets;
- ❖ SMS continuous improvement
- ❖ training relevant to operational safety assurance;
- ❖ documentation relevant to operational safety assurance: and
- ❖ develop and maintain formal means for safety communication


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CHAPTER THREE


SEARCH AND RESCUE SERVICES

3) GENERAL REQUIREMENTS FOR ATS PROVIDER

- 3.3 The SAR service Directorate responsible for the establishment of RCCs shall make arrangements to staff each RCC and, as appropriate, RSCs 24 hours a day by trained and qualified personnel proficient in the use of the language used for radiotelephony communications.
- 3.4 The SAR service Directorate responsible for the establishment of RCCs shall make arrangements to employ sufficient workforce skilled in coordination and operational functions at each RCC and RSC as appropriate
- 3.5 The SAR service Directorate responsible for the establishment of RCCs shall ensure that each RCC and, if appropriate, RSC develop written job descriptions for each of their technical staff.
- 3.6 The SAR service Directorate responsible for the establishment of RCCs shall ensure that each RCC and, if appropriate, RSC establish a training programme for their staff.
- 3.7 The SAR service Directorate responsible for the establishment of RCCs shall ensure that each RCC and, if appropriate, RSC maintain training records for their technical staff.
- 3.8 The SAR service Directorate responsible for the establishment of RCCs shall ensure that each RCC personnel involved in the conduct of radiotelephony communications are proficient in the use of the English language.

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3.9 The SAR service Directorate responsible for the establishment of RCCs shall ensure that SAR personnel are regularly trained and that appropriate SAR exercises are arranged.

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CHAPTER 4

AERONAUTICAL INFORMATION SERVICE

4.1 GENERAL REQUIREMENTS

- A)The service provider responsible for the provision of Aeronautical Information Service shall have written terms of reference/job descriptions for their technical staff.
- B)The service provider responsible for the provision of Aeronautical Information Service shall have a procedure to develop a training programme, including refresher training for its technical staff.
- C)The service provider responsible for the provision of Aeronautical Information Service shall provided refresher/recurrent training at least in every two years.
- D)The service provider responsible for the provision of Aeronautical Information Service shall have a procedure to maintain training records or files for its technical staff.
- E) The service provider responsible for the provision of Aeronautical Information Service shall have a procedure the receipt, amendment and distribution of ICAO provisions, and their amendments.
- F) The service provider shall have a procedure for the organization of Aeronautical Information Services as well as the design, contents, processing and distribution of aeronautical data and aeronautical information shall take into consideration Human Factors principles which facilitate their optimum utilization
- G) The service provider responsible for the provision of Aeronautical Information Service shall develop and implement a procedure for AIS inspector a free access to get information before finalization and publication of the AIS materials.)

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4.2 DOCUMENTATION REQUIREMENTS

- A) The service provider responsible for the provision of aeronautical Information Service shall hold copies of the relevant technical manuals, and all other regulatory documents, necessary for the provision of the services.
- B) The service provider responsible for the provision of Aeronautical Information Service shall have operational/administrative manual(s) for compliance by its personnel.
- C) The service Provider shall establish a procedure to control/update all above documents acceptable to the Director General of Civil Aviation.

4.3 OPERATIONAL REQUIREMENTS

- A) An AIS provider responsible for the provision AIS shall responsible for aeronautical information/data necessary for the safety; regularity or efficiency of air navigation is made available in a form in conformity with ICAO Annex 15
- B) AIS provider shall develop and implement a recognized quality system.
- C) AIS provider shall publish an aeronautical information publication (AIP) in accordance with Chapter 4 and Appendix 1 of Annex 15.
- D) An AIS provider shall receive, and/or originate, collate, edit, format, publish/store and distribute aeronautical information/data concerning the airspace in which Ethiopia has responsibility for the provision air traffic services. Aeronautical information shall be provided as an Integrated Aeronautical Information Package

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E) An AIS provider responsible for the provision AIS shall published geographical coordinates indicating latitude and longitude are expressed in terms of the World Geodetic System – 1984 (WGS-84) geodetic reference datum as in ICAO Doc 9674 - World Geodetic System – 1984 (WGS-84) Manual.

F) Automation enabling digital data exchange should be introduced with the objective of improving the speed, quality, efficiency and cost-effectiveness of aeronautical information services.


G) The AIS provider responsible for the provision of AIS shall responsible for the organization of the aeronautical information services as well as the design, contents, processing and distribution of aeronautical information/data shall take into consideration human factors principles which facilitate their optimum utilization.

H) Minimum facilities and equipment. The AIS provider shall responsible to have the following facilities and equipment in addition to basic office furniture and stationery available for the AIS headquarters and each NOF and aerodrome/heliport AIS unit:

AIS headquarters: personal computers (PCs) for each post, printer, internet Photocopier, telephones, fax, clock and intercom.

NOF and aerodrome/heliport AIS unit: Adequate table/counter space for processing information, PC/computer, photocopier, telephone, fax, internet, a reliable clock and intercom.

I) the AIS provider shall responsible to have the following formats available at international airport:-

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- Aircraft accident report
- Bird strike report
- Air traffic Incident report
- Faulty radio comm., Visual and Non visual Navigation AID report
- Wall display chart

4.4 Personnel Requirement

4.4.1 The AIS provider shall employ sufficient number of competent personnel to perform the operation of the service. The AIS provider shall provide in the operations manual an analysis of the number of personnel required to perform the aeronautical information service taking into account the duties and workload required.

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CHAPTER 5

PANS-OPS

5.1 GENERAL REQUIREMENTS

AIRCRAFT OPERATION

- A) The service provider responsible for the provision of PANS-OPS shall establish and implement minimum qualification requirements for its procedure specialists and shall be submitted to ANRD for approval.
- B) The service provider responsible for the provision of PANS OPS shall develop written terms of reference/job descriptions for their technical staff and shall be submitted to ANRD for approval.
- C) The service provider responsible for the provision of PANS-OPS shall develop and implement a training programme, which includes initial, specialized and recurrent training which is sufficient to acquire/maintain the required level of knowledge, skills, competence and qualifications in accordance with the duties and responsibilities assigned to the technical staff and shall be submitted to ANRD for approval.
- D) The service provider responsible for the provision of PANS-OPS shall develop and implement a training plan for a specific period of time detailing the time, the duration and the name of the person that takes the course. The plan should also indicate the content of the courses that indicates the level of knowledge and skills to be acquired from the course and it shall be submitted to ANRD for approval.
- E) The service provider responsible for the provision of PANS-OPS shall develop and implement a procedure to maintain training records or files for its technical staff.

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- F) The service provider responsible for the provision of Cartography Service shall establish and implement minimum qualification requirements for its cartographic specialists and it shall be submitted to ANRD for approval.

- G) The service provider responsible for the provision of Cartography Service shall develop written terms of reference/job descriptions for its cartographic technical staff and it shall be submitted to ANRD for approval.

- H) The service provider responsible for the provision of Cartography Service shall develop a training program detailing the type of training, the time and duration and priority of the training to be delivered and it shall be submitted to ANRD for approval.

- I) The service provider responsible for the provision of Cartography shall develop and implement a training plan for a specific period of time detailing the time, the duration and the name of the person that takes the course. The plan should also indicate the content of the courses that indicates the level of knowledge and skills to be acquired from the course and it shall be submitted to ANRD for approval.

- J) The service provider responsible for the provision of Cartography Service shall develop and implement a procedure to maintain training records or files for its technical staff.

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5.2 DOCUMENTATION REQUIREMENTS


CARTOGRAPHY SERVICE

- A) The service provider responsible for the provision of cartography service shall develop and implement procedures to hold copies of the relevant technical manuals, and all other documents, necessary for the provision of the services.
- B) The service Provider shall establish and implement a procedure to control/update documents acceptable to the Director General of Civil Aviation.

5.3 OPERATIONAL REQUIREMENTS

Requirement for procedure for air navigation services and aircraft operation (PANS-OPS)

1. The service provider responsible for the provision of PANS-OPS shall develop PANS-OPS Visual and Instrumental Flight Procedures in accordance with the guidance provided in ICAO PANS-OPS Aircraft Operations, (Construction of Visual and Instrumental Flight Procedures Manual) Doc 8168 volume II.
2. The service provider responsible for the provision of PANS-OPS shall establish and implement standard instrument arrivals routes (STAR) procedures when it is necessary to designate arrival routes from the en-route structure to the initial approach fix in accordance with procedure design criteria and process published in ICAO PANS-OPS (Doc.8168 Volume II) and procedures issued by Director General of Civil Aviation for the following navigational aids (sensors).

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❖ When designing STAR based on performance based navigation aids, the service provider shall :-

- Select the appropriate Navigation Specification in accordance with communication ,navigation and surveillance requirement
- Carry out calculation of parameters to determine protection for turning areas.
- Drawing of Primary and secondary protection area,
- Identify critical obstacles and apply appropriate MOC
- Apply appropriate methods for merging protection area with in 15 and 30NM from ARP.
- Determine MOCA for each segment and dissent gradient.
- Apply appropriate Procedural altitude , if applicable


❖ When designing STAR based on conventional NAV aids (VOR/DME,NDB etc), the service provider shall:-

- Carry out Calculation of parameters to determine protection for turning areas.
- Drawing of Primary and secondary protection area,
- Identify critical obstacles and apply appropriate MOC
- Apply appropriate methods for merging protection area
- Determine MOCA for each segment and dissent gradient.
- Apply appropriate procedural altitude , if applicable

3. The service provider responsible for the provision of PANS-OPS shall establish and implement procedures for instrument approach procedures for each runway at aerodromes including holding pattern and visual maneuvering area where instrument approach procedures are expected to be used in accordance with procedure design criteria and process published in ICAO PANS-OPS (Doc.8168 Volume II) and procedures issued by Director General of Civil Aviation that includes the following :-

A) Non-precision approach procedures

- ❖ The Service provider may consider Non -precision approach procedures to have five separate segments. They are the arrival, initial,

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intermediate, final and missed approach segments. In addition, an area for circling the aerodrome under visual conditions should be considered.

❖ **When designing non- precision approach procedures based on performance based navigation criteria , the service provider shall :**

- Select the appropriate Navigation Specification in accordance with communication ,navigation and surveillance requirement
- Carry out Calculation of parameters to determine protection for turning areas.
- Draw of Primary and secondary protection area for each segments
- Identify Critical obstacles and apply appropriate MOC
- Determine MOCA for each segment
- Determine dissent gradient for each segments including the missed approach gradient.
- Apply appropriate Procedural altitude , if applicable
- Determination OCA/H and publish the OCA/H on AIP that includes for visual circling approach for the applicable category of aircraft.

❖ **When designing non- precision approach procedures based on Conventional NAVAIDS (VOR/DME, NDB etc criteria, the service provider shall :**

- Carry out Calculation of parameters to determine protection for turning areas.
- Draw of Primary and secondary protection area for each segment
- Identify Critical obstacles and apply appropriate MOC
- Determine MOCA for each segment
- Determine dissent gradient for each segments including the missed approach gradient.
- Apply appropriate Procedural altitude , if applicable
- Determine OCA/H and publish the OCA/H on AIP that includes for

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visual circling approach for the applicable category of aircraft.

B) Precision approach procedures based on ILS procedure design criteria.

❖ When designing Precision approach procedures which are based on ILS procedure criteria, the service provider shall :

- Select Navigation Specification , if the ILS procedure is connected to PBN procedures,
- Carry out Calculation of parameters to determine protection for turning areas.
- Draw of Primary and secondary protection area for each segments
- Identify Critical obstacles and apply appropriate MOC for the non precision segment
- Determine MOCA for each non precision segment
- Determine descent gradient for each non precision segment
- Apply appropriate Procedural altitude , if applicable
 - Draw basic ILS surfaces and /or OAS
- Merge the ILS surfaces with intermediate segments.
 - Identify critical obstacles by applying basic ILS surfaces or *OAS ILS surfaces* or CRM method.
 - Determine OCA/H, with basic or *OAS ILS surfaces* or CRM method for the applicable category of aircraft
 - Publish the OCA/H on AIP that includes for visual circling approach for the applicable category of aircraft.

C) Construction of holding areas :-

❖ When Constructing of holding areas , the service provider shall

- Use the applicable facility fix tolerance area
- Perform calculations associated with the construction of basic holding areas
- Draw basic holding area

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- Determine respective omnidirectional entry area to accommodate the specified entry procedures.
- Determine the buffer area
- Draw the overall holding area
- Identify critical obstacle and apply appropriate MOC and vegetation
- Determine Minimum holding altitude


4. The service provider responsible for the provision of PANS-OPS shall establish standard instrument departure procedures (SID) for each runway at aerodromes where instrument departures are expected to be used in accordance with procedure design criteria and process published in ICAO PANS-OPS (Doc.8168 Volume II) and procedures issued by Director General of Civil Aviation that includes the following navigational aids (sensors) :-

a) performance based navigation criteria

- ❖ When designing SID based on performance based navigation aids, the service provider shall :-
 - Select the appropriate Navigation Specification in accordance with communication ,navigation and surveillance requirement
 - Carry out calculation of parameters to determine protection for turning areas.
 - Drawing of Primary and secondary protection area,
 - Identify critical obstacles and apply appropriate MOC
 - Apply appropriate methods for merging protection area with in 15 and 30NM from ARP.
 - Determine MOCA for each segment and climb gradient
 - Apply appropriate procedural altitude , if applicable

b) Conventional NAV aids (VOR/DME, NDB etc) criteria

- ❖ When designing SID based on conventional NAV aids (VOR/DME,NDB etc), the service provider shall:-
 - Carry out Calculation of parameters to determine protection for turning areas.
 - Drawing of Primary and secondary protection area,
 - Identify critical obstacles and apply appropriate MOC

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- Apply appropriate methods for merging protection area
- Determine MOCA for each segment and climb gradient
- Apply appropriate procedural altitude , if applicable

5. The OCA/H shall be established and published on AIP by air space management. Aerodrome operating minima (i.e. visibility, MDA/H, DA/H,) for instrument approaches at aerodromes shall be established by aircraft operators based on the published OCA/H and other factors according to the regulation and guidance provided on ECARAS-PART 8.

6. The service provider responsible for the provision of PANS-OPS shall retain all procedure design documentation so as to allow any data anomalies or errors found during the production, maintenance or operational use of the procedure to be corrected. The documentation shall include the following.

- STAR
- SID
- Holding pattern
- Non precision approach procedures including visual circling area.
- Precision approach procedures including visual circling area.

The detail content of the procedure design documentation for the above mentioned phases of flight (STAR, SID ,holding pattern and approach procedures) shall also include:-

- a) Documentation required for publication in the AIP in accordance with ECARS PART -21 and 13.
- b) Documentation required maintaining transparency concerning the criteria used by the procedure designer including supporting information and data

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used in the design, such as: all the calculations, the drawing of the protection areas for each phases of flight including holding pattern and Visual circling area. It shall also include the critical obstacles and applied MOC, MOCA, procedural altitude and other relevant factors that are considered in the flight procedure design process.

c) Additional documentation can also be established to facilitate ground and flight validation of the procedures.

7. The service provider responsible for the provision of PANS-OPS shall conduct ground and flight validation of instrument flight procedures in accordance with procedure design criteria and process published in ICAO PANS-OPS (Doc.8168 Volume II) and procedures issued by Director General of Civil Aviation.

The service provider when conducting ground and flight validation of instrument flight procedures shall consider the following:-


- **Ground validation**

Ground validation shall be carried out to review the entire instrument flight procedure package by a person trained in procedure design and with appropriate knowledge of flight validation issues. It is meant to catch errors in criteria and documentation, and evaluate on the ground, to the extent possible, those elements that will be evaluated in a flight validation. Issues identified in the ground validation should be addressed prior to any flight validation. The ground validation will also determine if flight validation is needed for modifications and amendments to previously published procedures.

- **Flight validation-** Flight validation of instrument flight procedures shall be carried out by the service provider to meet the following objectives:-

- Provide assurance that adequate obstacle clearance has been provided;
- Verify that the navigation data to be published, as well as that used in the design of the procedure, is correct;
- Verify that all required infrastructure, such as runway markings, lighting, and

Communications and navigation sources, are in place and operative;

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- d) Conduct an assessment of fly ability to determine that the procedure can be safely flown; and
- e) Evaluate the charting, required infrastructure, visibility and other operational factors.

1. Requirement for Aeronautical Cartography

1.1 The entities responsible for chart production and distribution in air navigation services shall meet the requirement of distribution system that facilitates prompt availability of the charts to States, organizations or individuals requiring them.

The Service provider responsible for making available to users all charts which are applicable in Ethiopia shall:-

1. Produce distribution list and
2. Publish all applicable charts on the AIP and /or AIP supplements or distribute by other appropriate methods.


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CHAPTER 6

COMMUNICATION, NAVIGATION AND SURVEILLANCE

6.1 GENERAL REQUIREMENTS

- A) The service provider responsible for the provision of CNS shall have a procedure to develop a training programme, including refresher training for its technical staff and shall be approved by the Air Navigation Regulation Directorate.
- B) The service provider responsible for the provision of CNS shall have a procedure to maintain training records or files for its technical staff.
- C) The service provider responsible for the provision of CNS Service shall have written terms of reference/job descriptions for their technical staff.
- D) The service provider responsible for the provision of CNS shall maintain the Navigational Aids equipment test requirements according to ECARS part 16.
- E) The service provider responsible for the provision of CNS shall have a plan for periodic ground testing and Flight testing using the procedures provided by ECARAS part 16 and/or equipment manufacturer are manual for All Radio Navigation Aids facilities.
- F) The service provider responsible for the provision of CNS shall calibrate navigational aid equipment using an appropriately equipped aircraft and performed by a qualified flight inspection pilot and appropriately trained flight inspector for Flight Inspection to be carried out.
- G) The service provider responsible for the provision of CNS shall have procedure for newly established radio navigation aids and must be authorized before it can be placed into operational service. All newly installed radio navigation aids must be subject to commissioning in accordance with the Flight Inspection Manual of Procedures ICAO Doc. 8071, Vol. 1 (Manual on Testing of Radio Navigation Aids).

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H) The service provider responsible for the provision of CNS shall have a procedure for Airborne and ground support flight inspection equipment and must be calibrated to a standard traceable to the national and international standards and technology or equivalent.

6.2 DOCUMENTATION REQUIREMENTS

- A. The service provider responsible for the provision of CNS shall develop and implement Standard and procedures to be adopted during the conduct of Flight Inspections as per the requirement stated in ECRAS part 16.
- B. The service provider responsible for the provision of CNS shall develop Flight inspection interval and periodicity and shall conform to the Flight Inspection Manual of Standards. Refer to Doc 8071)
- C. The service provider responsible for the provision of CNS shall develop and implement procedure for Navigational Aid Facilities to be tested and maintained using test equipment that is maintained and calibrated in accordance with the accepted standards required.
- D. The service provider responsible for the provision of CNS shall make available the necessary test and measuring equipment for the operation, performance inspection and maintenance of all its facilities.
- E. The service provider responsible for the provision of CNS shall have documented procedures to control, calibrate and maintain test equipment.
- F. The service provider responsible for the provision of CNS shall have an item of test equipment that carries a visual identification of its calibration status, the date that the equipment was last calibrated and the prescribed calibration periodicity.
- G. The service provider responsible for the provision of CNS shall develop a Flight inspection comprehensive report on the accuracy, coverage or any other aspect of the performance of a service or

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facility conducted by using calibrated test equipment on board an aircraft in flight.

- H. The service provider responsible for the provision of CNS shall have an Operations Manual that describe the procedures to be used to monitor the performance of each service and facility, and to compare the results with the appropriate technical specification;
- I. The service provider responsible for the provision of CNS shall have the procedure to be used to report any deviations from standards found during operation and maintenance of the facility.

6.3 OPERATIONAL REQUIREMENTS

- A. The service provider responsible for the provision of CNS shall implement Periodic performance inspections for ground tests on site and flight inspections at defined time intervals.
- B. The service provider responsible for the provision of CNS Service shall do Special Flight inspection to be conducted before an air navigation facility put into operational service following a major repair, alteration, modification or changes that may affect its required performances.
- C. The service provider responsible for the provision of CNS Service shall provide the necessary tools and equipment considered to be necessary in the delivery of service.
- D. The service provider responsible for the provision of CNS Service shall make available Manufacturer’s equipment handbooks, Operational and Maintenance Instructions, the logistics support and spare parts listings, as relevant to each facility, and for each associated item of test equipment to be used for maintenance.
- E. The service provider responsible for the provision of CNS shall have the responsibility to arrange frequency and identification codes/call signs of CNS service equipment before making any transmission.
- F. The service provider responsible for the provision of CNS shall have the procedures to be used for the conduct of daily and scheduled preventive maintenance including procedures for repair.

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CHAPTER 7

Aeronautical Meteorology

7.1 GENERAL REQUIREMENTS

- A) Air Navigation regulation shall ensure aeronautical meteorological services comply with the requirements of the World Meteorological Organization in respect of qualifications and training of meteorological personnel providing service for international air navigation.
- B) Aviation Meteorology Service shall arrange for its aeronautical meteorological stations to be inspected at sufficiently frequent intervals to ensure that a high standard of observation is maintained, that instruments and all their indicators are functioning correctly.
- C) Automated equipment for measuring and for monitoring and remote indicating of surface wind, visibility, height of cloud base, air and dew-point temperatures and atmospheric pressure shall be installed to support approach and landing and take-off operations.
- D) List of criteria for special observations shall be established by the National Meteorology Agency in consultation with the ATS.
- E) Local routine and special reports and METAR and SPECI shall contain the required elements in the order manner indicated as:
 - the type of report;
 - location indicator;
 - time of the observation;
 - surface wind direction and speed;
 - visibility;
 - present weather;
 - cloud amount, cloud type only for cumulonimbus and towering cumulus clouds and
 - height of cloud base;
 - air temperature and dew-point temperature and
 - QNH.

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F) Sensors for representative the surface wind observations for local routine and special reports should be sited to give the best practicable indication of the conditions along the runway and the touchdown zone.

G) Special observations of moderate or severe turbulence, thunderstorms with or without hail, widespread or in squall lines, volcanic ash cloud, or pre-eruption volcanic activity or a volcanic eruption shall be made by aircraft whenever they are encountered or observed.

H) National Meteorology Agency shall make arrangements with the ATS authority to ensure that, on receipt by the air traffic services units of the special air traffic services units relay them without delay to their associated meteorological watch office.

I) An aerodrome forecast shall be issued at a specified time not earlier than one hour prior to the beginning of its validity period and consist the expected meteorological conditions at an aerodrome for a specified period.

J) Aerodrome Terminal forecast (TAF) and amendments shall be issued including the required information in the orderly manner indicated as:

- 1) identification of the type of forecast; 2) location indicator; 3) time of issue of forecast; 4) identification of a missing forecast, 5) date and period of validity of forecast; 6) surface wind; 7) visibility; 8) weather 9) cloud; and expected significant changes to one or more of these elements during the period of validity.

K) A forecast for take-off shall be prepared by the aerodrome meteorological office designated by National Meteorological Agency.

L) ECAA, Having accepted the responsibility for providing air traffic services within a flight information region or a control area, on the basis of NMA and ATS agreement, one meteorological watch office shall be established.


M) AIRMET information shall be issued by a meteorological watch office and shall be cancelled when the phenomena are no longer occurring or are no longer expected to occur in the area.

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- N) Wind shear warnings shall be prepared by the aerodrome meteorological office for aerodromes where wind shear is considered a safety factor for aircraft, with the appropriate air traffic services units and operators concerned.
- A) Briefing and/or consultation shall be provided, on request, to flight crew members and/or other flight operations.
- B) The Meteorological service provider shall arrange for the supply of up to- date meteorological information to aeronautical information services units, as necessary, for the conduct of their functions.
- C) Suitable Communication facilities shall be made available to permit aerodrome meteorological offices and, as necessary, aeronautical meteorological stations to supply the required meteorological information to air traffic services units.

7.2 DOCUMENTATION REQUIREMENTS

- A) ANR shall ensure the National meteorology agency establishes and implements a properly organized quality system comprising procedures, processes, and resources necessary to provide for the quality management of the meteorological information to be supplied to the users.
- B) An agreement between the meteorological authority and the appropriate ATS authority shall be established to cover,
 - the provision in air traffic services units of displays related to integrated automatic
 - systems;
 - the calibration and maintenance of these displays/instruments; and
 - The use to be made of these displays/instruments by air traffic services personnel.
- C) Landing forecasts shall be prepared in the form of a trend forecast.
 - Local routine and local special reports
 - METAR and SPECI are issued in accordance with the format in Annex 3.
- D) Terminal Aerodrome Forecast (TAF) is issued in accordance with the format in Annex 3.
 - SIGMET and AIRMET information,
 - Aerodrome warnings and
 - Wind shear warnings and alerts

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7.3 OPERATIONAL REQUIREMENTS

- A. An aerodrome meteorological office shall carry out all or some of the following functions:
- prepare and/or obtain forecasts of local meteorological conditions;
 - provide briefing, consultation and flight documentation to flight crew members;
 - supply other meteorological information to aeronautical users;
 - display the available meteorological information; and
 - exchange meteorological information with other aerodrome meteorological offices
 - To meet the needs of flight operations at the aerodrome.
- B. At aerodromes, routine observations shall be made throughout the 24 hours each day, except as otherwise agreed between the meteorological authority, the appropriate ATS authority, such observations shall be made at intervals of one hour
- C. Reports of special observations shall be issued as:
- local special reports intended for arriving and departing aircraft
 - SPECI intended for flight planning.
- D. Aerodrome Terminal Forecast (TAF) shall be prepared, by the aerodrome meteorological office.
- E. a landing forecast shall be prepared by the aerodrome meteorological office which designated by National meteorology agency.
- F. a meteorological watch office shall maintain continuous watch over meteorological conditions affecting flight operations, issue or prepare and disseminate SIGMET, and supply information received on pre-eruption volcanic activity, a volcanic eruption and volcanic ash cloud.
- G. Briefing and/or consultation shall be provided, on request, to flight crew members and/or other flight operations.