	Company Name <b>የኢትዮጵያ ሲቪል አቪዬሽን ባለሥልጣን</b> <b>Ethiopian Civil Aviation Authority</b>	Document No. <b>ECAA-ANR-AC-023</b>	
Document title <b>Guidance for the development of evaluation procedure for application of separation minima in PANS/ATM &amp; Regional Supplementary Procedures</b>		Issue No. <b>1</b>	Page No. <b>Page 1 of 10</b>

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



**Wossengetch Hunegnaw (Col.)**  
**Director General**



	Company Name <b>የኢትዮጵያ ሲቪል አቪዬሽን ባለሥልጣን</b> <b>Ethiopian Civil Aviation Authority</b>	Document No. ECAA-ANR-AC-023	
Document title Guidance for the development of evaluation procedure for application of separation minima in PANS/ATM & Regional Supplementary Procedures		Issue No. 1	Page No. Page 2 of 10

## 1. PURPOSE

*This guidance provides instruction on the development and review of the procedure for separation minima in the Air Traffic Control Services.*

## 2. REFERENCE


- 2.1 ECARAS Part - 14; 14.3.4
- 2.2 ICAO PANS ATM DOC 4444/ATM chapter 5
- 2.3 Annex 11 3.4.1
- 2.4 Doc 7030 chapter 4,5 & 6

## 3. GUIDANCE

### 3.1 GENERAL INFORMATION

*The selection of separation minima for application within a given portion of airspace shall be as follows:*

- 3.1.1 *The separation minima shall be selected from those prescribed by the provisions of the PANS-ATM (Doc 4444) and the Regional Supplementary Procedures as applicable under the prevailing circumstances except that, where types of aids are used or circumstances prevail which are not covered by current ICAO provisions, other separation minima shall be established as necessary by:*
  - a) *the appropriate ATS authority, following consultation with operators, for routes or portions of routes contained within the sovereign airspace of a State;*

	Company Name <b>የኢትዮጵያ ሲቪል አቪዬሽን ባለሥልጣን</b> <b>Ethiopian Civil Aviation Authority</b>	Document No. ECAA-ANR-AC-023	
Document title Guidance for the development of evaluation procedure for application of separation minima in PANS/ATM & Regional Supplementary Procedures		Issue No. 1	Page No. Page 3 of 10

*b) Regional air navigation agreements for routes or portions of routes contained within airspace over the high seas or over areas of undetermined sovereignty.*

*3.2 Larger separations than the specified minima should be applied whenever exceptional circumstances such as unlawful interference or navigational difficulties call for extra precautions. This should be done with due regard to all relevant factors so as to avoid impeding the flow of air traffic by the application of excessive separations.*

#### **4. EVALUATION**

##### **GENERAL**

*ATS provider established separation minima in accordance PANS-ATM (Doc 4444) and the Regional Supplementary Procedures.*

*4.1 ATS provider provide Vertical or horizontal separation shall be provided:*

- a) Between all flights in Class A and B airspaces;*
- b) Between IFR flights in Class C, D and E airspaces;*
- c) Between IFR flights and VFR flights in Class C airspace;*
- d) Between IFR flights and special VFR flights; and*
- e) Between special VFR flights, when so prescribed by the appropriate ATS authority.*

##### **4.2 VERTICAL SEPARATION MINIMUM**

*4.2.1 a nominal 300 m (1 000 ft) below FL 290 and a nominal 600 m (2 000 ft) at or above this level, except as provided below; and*



Company Name

**የኢትዮጵያ ሲቪል አቪዬሽን ባለሥልጣን**  
**Ethiopian Civil Aviation Authority**

Document No.

ECAA-ANR-AC-023

Document title

Guidance for the development of evaluation procedure for application of separation minima in PANS/ATM & Regional Supplementary Procedures

Issue No.

1

Page No.

Page 4 of 10

4.2.2 *Within designated airspace, subject to a regional air navigation agreement: a nominal 300 m (1 000 ft) below FL 410 or a higher level where so prescribed for use under specified conditions, and a nominal 600 m (2 000 ft) at or above this level. / RVSM refers to a vertical separation minimum of 300 m (1 000 ft) between FL 290 and FL 410 inclusive.*

4.3 *HORIZONTAL SEPARATION MINIMUM (In accordance PANS-ATM (Doc 4444) and the Regional Supplementary Procedures)*

4.4 *Lateral Separation Minima*

4.4.1 *By reference to the same or different geographic locations.*

4.4.2 *By use of the same navigation aid or method.*

a) *VOR collocated DME & VOR only*

- *Two out bound aircraft*
- *Two inbound aircraft*
- *One out bound and one inbound aircraft*

b) *NDB*

- *Two out bound aircraft*

c) *RNAV operations:*

- *Two out bound aircraft*
- *Two inbound aircraft*
- *One out bound and one inbound aircraft*

4.5 *LONGITUDINAL SEPARATION MINIMUM*



Company Name

**የኢትዮጵያ ሲቪል አቪዬሽን ባለሥልጣን**  
**Ethiopian Civil Aviation Authority**

Document No.

ECAA-ANR-AC-023

Document title

Guidance for the development of evaluation procedure for application of separation minima in PANS/ATM & Regional Supplementary Procedures

Issue No.

1

Page No.

Page 5 of 10

4.5.1 *Speed control, including the Mach number technique.*

4.5.2 *Time-based or*

a) *To depart at a specified time,*

b) *To arrive over a geographical location at a specified time, or*

c) *To hold over a geographical location until a specified time.*

4.5.3 *Distance-based*

a) *37 km (20 NM), provided:*

b) *19 km (10 NM), provided:*

5 *Longitudinal Separation minima based on time*

5.1 *Aircraft flying on the same track*

5.2 *Aircraft flying on crossing tracks:*

6 *LATERAL SEPARATION MINIMUM*

6.1 *Lateral separation of aircraft is obtained by requiring operation*

a) *On different routes or*

b) *In different geographical locations as determined by visual observation, by the use of navigation aids or*

c) *By the use of area navigation (RNAV) equipment.*

6.2 *By reference to the same or different geographic locations. By position reports which positively indicate the aircraft are over different geographic locations as determined visually or by reference to a navigation aid*



Company Name

**የኢትዮጵያ ሲቪል አቪዬሽን ባለሥልጣን**  
**Ethiopian Civil Aviation Authority**

Document No.

ECAA-ANR-AC-023

Document title

Guidance for the development of evaluation procedure for application of separation minima in PANS/ATM & Regional Supplementary Procedures

Issue No.

1

Page No.

Page 6 of 10

6.3 *By use of NDB, VOR or GNSS on intersecting tracks or ATS routes. By requiring aircraft to fly on specified tracks which are separated by a minimum amount appropriate to the navigation aid employed. Lateral separation between two aircraft exists when:*

6.4 *VOR: both aircraft are established on radials diverging by at least 15 degrees and at least one aircraft is at a distance of 28 km (15 NM) or more from the facility*


6.5 *NDB: both aircraft are established on tracks to or from the NDB which are diverging by at least 30 degrees and at least one aircraft is at a distance of 28 km (15 NM) or more from the facility*

5.5 *GNSS/GNSS: each aircraft is confirmed to be established on a track with zero offset between two waypoints and at least one aircraft is at a minimum distance from a common point*

5.6 *VOR/GNSS: the aircraft using VOR is established on a radial to or from the VOR and the other aircraft using GNSS is confirmed to be established on a track with zero offset between two waypoints and at least one aircraft is at a minimum distance from a common point*

7. *Lateral separation of aircraft on published adjacent instrument flight procedures for arrivals and departures*

7.1 *Lateral separation of departing and/or arriving aircraft, using instrument flight procedures, will exist:*

	Company Name <b>የኢትዮጵያ ሲቪል አቪዬሽን ባለሥልጣን</b> <b>Ethiopian Civil Aviation Authority</b>	Document No. ECAA-ANR-AC-023	
Document title Guidance for the development of evaluation procedure for application of separation minima in PANS/ATM & Regional Supplementary Procedures		Issue No. 1	Page No. Page 7 of 10

a) *Where the distance between RNAV 1, Basic RNP 1, RNP APCH and/or RNP AR APCH tracks is not less than 7 NM; or*

b) *Where the protected areas of tracks designed using obstacle clearance criteria do not overlap and provided operational error is considered.*

8. *Lateral separation of aircraft on parallel or non-intersecting tracks or ATS routes. Within designated airspace or on designated routes, lateral separation between aircraft operating on parallel or non-intersecting tracks or ATS routes shall be established in accordance with the following:*


8.1 *For a minimum spacing between tracks of 50 NM a navigational performance of RNAV 10 (RNP 10) or RNP 4 shall be prescribed; and*

8.2 *For a minimum spacing between tracks of 30 NM a navigational performance of RNP 4 shall be prescribed.*

## **9. ATS SURVEILLANCE SYSTEMS CAPABILITIES**

### *9.1 GENERAL*

a) *ATS surveillance systems used in the provision of air traffic services shall have a very high level of reliability, availability and integrity. The possibility of system failures or significant system degradations which may cause complete or partial interruptions of service shall be very remote. Backup facilities shall be provided.*

	Company Name <b>የኢትዮጵያ ሲቪል አቪዬሽን ባለሥልጣን</b> <b>Ethiopian Civil Aviation Authority</b>	Document No. ECAA-ANR-AC-023	
Document title Guidance for the development of evaluation procedure for application of separation minima in PANS/ATM & Regional Supplementary Procedures		Issue No. 1	Page No. Page 8 of 10

- b) *a situation display providing surveillance information to the controller shall, as a minimum, include position indications, map information required to provide ATS surveillance services and, where available, information concerning the identity of the aircraft and the aircraft level.*
- c) *Information derived from ATS surveillance systems, including safety-related alerts and warnings such as conflict alert and minimum safe altitude warning, should be used to the extent possible in the provision of air traffic control service in order to improve capacity and efficiency as well as to enhance safety.*
- d) *For safe and efficient use of SSR and ADS-B, pilots and controllers shall strictly adhere to published operating procedures and standard radiotelephony phraseology shall be used. The correct setting of transponder codes and/or aircraft identification shall be ensured at all times.*

## 9.2

- a) *Before providing ATS surveillance service to an aircraft, identification shall be established and the pilot informed. Thereafter, identification shall be maintained until termination of the ATS surveillance service.*
- b) *Transfer of identification from one radar controller to another should only be attempted when it is considered that the*





Company Name

**የኢትዮጵያ ሲቪል አቪዬሽን ባለሥልጣን**  
**Ethiopian Civil Aviation Authority**

Document No.

ECAA-ANR-AC-023

Document title

Guidance for the development of evaluation procedure for application of separation minima in PANS/ATM & Regional Supplementary Procedures

Issue No.

1

Page No.

Page 9 of 10

*aircraft is within the accepting controller's surveillance coverage.*

- c) Vectoring shall be achieved by issuing to the pilot specific headings which will enable the aircraft to maintain the desired track.*
- d) An aircraft which has been informed that it is provided with ATS surveillance service should be informed immediately when, for any reason, the service is interrupted or terminated.*

*9.3 Evaluate the Air traffic surveillance system clearly stated*

*9.3.1 Surveillance service*

*9.3.2 Surveillance procedure*

*9.3.3 Vectoring*

*9.3.4 Surveillance separation R*

*a) horizontal separation minima based on*

- PSR*
- SSR*
- ADS-B*
- PSR and SSP*
- PSR and ADS-B*
- SSR and ADS-B*

*b) Wake turbulence Surveillance separation minima*

*c) Larger separation minima*

*d) Mixed environment*

*e) ATS Surveillance system failure*



Company Name

**የኢትዮጵያ ሲቪል አቪዬሽን ባለሥልጣን**  
**Ethiopian Civil Aviation Authority**

Document No.

ECAA-ANR-AC-023

Document title

Guidance for the development of evaluation procedure for application of separation minima in PANS/ATM & Regional Supplementary Procedures

Issue No.

1

Page No.

Page 10 of 10

*9.3.5 Surveillance sequencing*

*9.3.6 Emergency hazards and Surveillance equipment failure*

*9.3.7 Surveillance monitoring*

*9.3.8 Surveillance coordination*

- *phraseologies for identification of aircraft for primary RADAR*
- *secondary surveillance RADAR*
- *ADS-B phraseologies*
- *Surveillance vectoring phraseologies*
- *Phraseologies for sequencing*