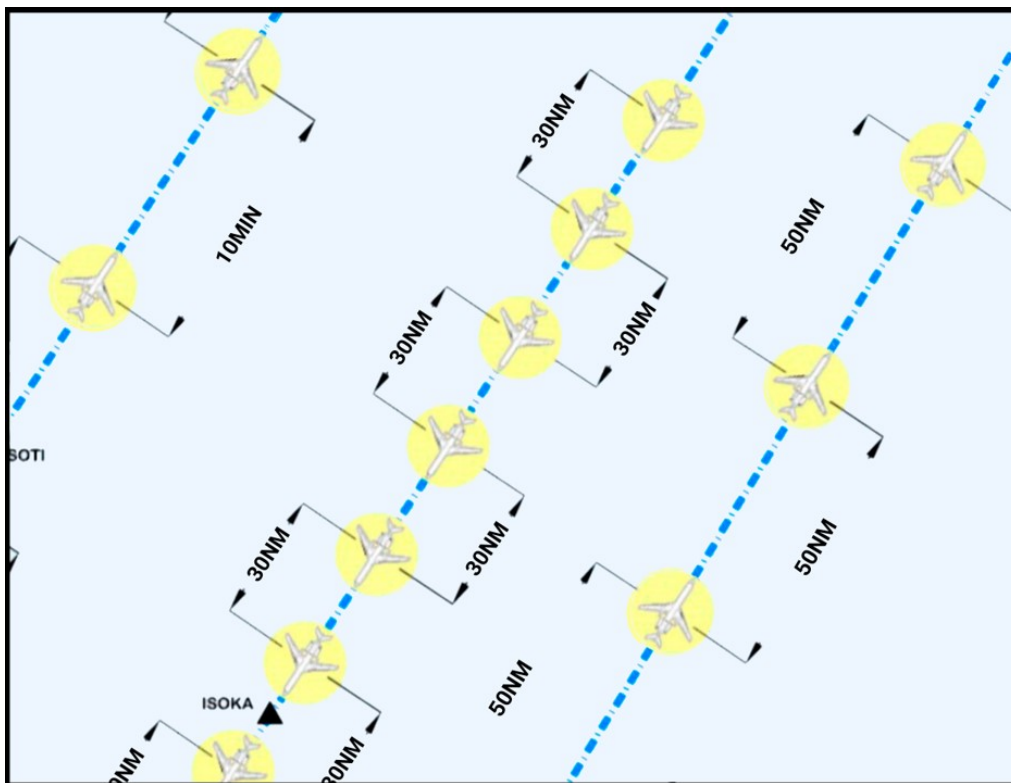


# Application of Separation Minima in EUR/SAM Corridor

ALIGNED WITH ICAO DOC 4444



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## 1. Introduction

- 1.1. This Document is published on behalf of the EUR-SAM Corridor Implementation Team (ESCIT) and represents the separation methods and minima that will be applied to aircraft transiting the EUR-SAM Corridor based on agreement by the member Air Traffic Service providers. It contains definitions, general rules pertaining to the application of separation minima, separation minima in the vertical, lateral, and longitudinal planes applicable to aircraft operating in the EUR-SAM Corridor. Procedures for Air Navigation Services-Air Traffic Management (Doc 4444) should be read in conjunction with this document. It mainly applies to the separation of aircraft that are communicating via a radio station or via CPDLC. Separation standards as specified in the PANS-ATM may also be applied when aircraft are in Direct Controller Pilot VHF voice Communication.
- 1.2. This document is a starting point to the definition of a working method for operational air traffic control personnel. It serves as a written and pictorial interpretation of separation rules and their application, its overall objective being a common application of separation minima throughout the EUR-SAM Corridor.
- 1.3. The EUR-SAM Corridor airspace is integrated by the defined areas of Canarias FIR, Sal Oceanic FIR, Dakar Oceanic FIR and Atlantico FIR, as shown in Figure 1 (EUR-SAM Corridor Airspace). It includes a group of airways (dark blue) and a random route area (light blue), and this document applies to both these areas.



Figure 1 EUR-SAM Corridor Airspace

- 1.4. PBCS based separations are reliant not only on the certification of the aircraft but also on the infrastructure available at each time, and for each aircraft. So ANSPs need the ability to apply different separation minima if aircraft have different equipage levels or certifications. For example, ATC can be applying, at the same time, 30NM between two PBCS certified aircraft (RNP4, with

ADS-C and CPDLC) and 10 minutes between one of those and another aircraft, that is not PBCS certified. Additionally, if by some reason there is a datalink outage or a connection issue, that disables ADS-C and CPDLC, than ANSPs need to be ready to assess the situation and apply an alternative separation minimum.

## 2. Definitions

**COMMON POINT** - A point on the surface of the earth common to the tracks of two aircraft, used as a basis for the application of separation (e.g. significant point, waypoint, navigation aid, fix).

**CRUISE CLIMB** - An aeroplane cruising technique resulting in a net increase in altitude as the aeroplane mass decreases.

**CRUISING LEVEL** - A level maintained during a significant portion of a flight.

**DIVERGING TRACKS** – Tracks downstream of the common point whose angular divergence is equal to or less than 90 degrees.

**FLIGHT LEVEL** - A surface of constant atmospheric pressure that is related to a specific pressure datum, 1013.2 hectopascals (hPa), and is separated from other such surfaces by specific pressure intervals.

**FORMATION FLIGHT** - More than one aircraft which, by prior arrangement between the pilots, operate as a single aircraft regarding navigation and position reporting. Separation between the aircraft within the formation remains the responsibility of the flight leader and the pilots of the other aircraft in the flight, including periods when aircraft within the formation are manoeuvring to attain separation from each other to effect individual control and during join-up and break-away.

**LATERAL SEPARATION** - Lateral separation is the specified spacing between aircraft expressed in terms of distance or angular displacement between tracks.

**LONGITUDINAL SEPARATION** - Longitudinal separation is the specified interval between aircraft expressed in units of time or distance along track.

**MACH NUMBER TECHNIQUE** - The term used to describe the technique of clearing aircraft operating along the same identical track or continuously diverging tracks to maintain specified true Mach numbers in order to maintain adequate longitudinal separation between successive aircraft at, or climbing or descending to, the same level.

**NAMED POINT** - A reporting point identified by a name as well as by latitude and longitude.

**OTHER MEANS** - Position information derived from advanced ATC automation systems that consider multiple sources of information namely voice reports, ADS and/or CPDLC reports, estimates and weather information, may be the basis for applying separation standards.

**OPPOSITE DIRECTION AIRCRAFT** - Aircraft operating on tracks whose angular differences are from 90° up to and including 180°.

**PASSING POINT** - The point where aircraft are at the minimum distance from each other and from which longitudinal separation is calculated. This may or may not coincide with the common point.

**REDUCED VERTICAL SEPARATION MINIMUM** – The application of 1000 feet vertical separation from FL290 thru FL410 between approved aircraft in RVSM designated airspace.

**SAME DIRECTION AIRCRAFT** - Aircraft operating on tracks whose angular differences are from 0° up to but not including 90°.

**SAME IDENTICAL TRACK** – Aircraft paths whose projections on the earth’s surface are exactly the same.

**SIGNIFICANT POINT** - A significant point is a NAVAID, a fix derived from a NAVAID(s), a named point, or geographical coordinate(s) expressed in degrees of latitude, longitude or both, established for the purpose of providing separation, as a reporting point or to delineate a route of flight.

**STEP CLIMB** - A technique in which higher altitudes or flight levels are flight planned or achieved at a specified point or time.

**TRACK** - The great circle projection on the earth’s surface of the path of an aircraft, the direction of which path at any point is usually expressed in degrees from North (true, magnetic, or grid).

**VERTICAL SEPARATION** - Vertical separation is the specified spacing of aircraft expressed in altitudes or flight levels.

### 3. Acronyms

ADS-B	AUTOMATIC DEPENDENT SURVEILLANCE – BROADCAST
ADS-C	AUTOMATIC DEPENDENT SURVEILLANCE – CONTRACT
ATC	AIR TRAFFIC CONTROL
ATS	AIR TRAFFIC SERVICE
CPDLC	CONTROLLER/PILOT DATA LINK COMMUNICATIONS
CTA	CONTROL AREA
FIR	FLIGHT INFORMATION REGION
FL	FLIGHT LEVEL
GNSS	GLOBAL NAVIGATION SATELLITE SYSTEM
ICAO	INTERNATION CIVIL AVIATION ORGANIZATION
MNT	MACH NUMBER TECHNIQUE
MNPS	MINIMUM NAVIGATION PERFORMANCE SPECIFICATIONS
SAT	SOUTH ATLANTIC
OCA	OCEANIC CONTROL AREA
PBCS	PERFORMANCE BASED COMMUNICATION & SURVEILLANCE
PBN	PERFORMANCE BASED NAVIGATION
NM	NAUTICAL MILES
PANS-ATM	PROCEDURES FOR AIR NAVIGATION SERVICES- AIR TRAFFIC MANAGEMENT (Doc 4444)
RCP	REQUIRED COMMUNICATION PERFORMANCE
RNP	REQUIRED NAVIGATION PERFORMANCE
RSP	REQUIRED SURVEILLANCE PERFORMANCE
RVSM	REDUCED VERTICAL SEPARATION MINIMUM
VHF	VERY HIGH FREQUENCY

## 4. Separation

- 4.1. Separation is the generic term used to describe action on the part of ATC to keep aircraft, operating in the same general area, at such distances from each other that the risk of their colliding with each other is reduced. Separation can be provided in two planes, horizontal and vertical. Separation in the horizontal plane can be achieved either longitudinally (by spacing aircraft behind each other at a specified distance, normally expressed in flying time) or laterally (by spacing aircraft side by side, but again at a specified distance from each other).
- 4.2. The required separation between aircraft is generally expressed in terms of minima, i.e. in distances which should not be infringed. Separation minima for the ICAO South Atlantic Region are specified in firm values of distance; horizontally in nautical miles (NM); vertically in feet or flight levels, or in values of time between the moment a preceding aircraft passes over a given point and that time when the next aircraft is allowed to pass over the same point.
- 4.3. An air traffic control clearance shall not be given which would reduce the spacing between aircraft to less than the applicable separation minimum.
- 4.4. Where the type of separation or minimum used to separate aircraft cannot be maintained, action shall be taken to ensure that another type of separation or another minimum exists or is established prior to the time when the previously used separation would be insufficient.

### SEPARATION MINIMA

- 4.5. In defining appropriate minima, the primary consideration is the accuracy with which the relevant parameters can be measured. Thus, vertical minima depend on the accuracy of the altimetry system, lateral minima on navigational accuracy and longitudinal minima even on the quality of meteorological information available.

### VERTICAL SEPARATION

- 4.6. Minimum vertical separation between aircraft, airspace reservations, and between airspace reservations and other aircraft shall be:
  - A. 4000 feet at or above FL 450 between supersonic aircraft, and between supersonic aircraft and any other aircraft.
  - B. 2000 feet at or above FL 290 between a formation flight and any other aircraft.<sup>1</sup>
  - C. 2000 feet at or above FL 290.<sup>2</sup>
  - D. 1000 feet from FL 290 to FL 410 inclusive between RVSM aircraft.<sup>3 4</sup>
  - E. 1000 feet below FL 290.

### LATERAL SEPARATION

- 4.7. Lateral separation is applied between route segments. Segments may be wholly or partly separated but for aircraft to be laterally separated both must be within the separated segments (or segment parts).

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<sup>1</sup> Formation flights are treated as non-RVSM. Such flights shall be vertically separated from other traffic by the non-RVSM separation minimum of 2000 feet within the RVSM designated flight levels.

<sup>2</sup> Non-RVSM aircraft may be cleared to climb or descend through the RVSM-designated flight levels provided that the aircraft will carry out a continuous climb or descent through all RVSM-designated flight levels.

<sup>3</sup> Non-RVSM aircraft may also, under specific circumstances, be granted exemptions to operate in RVSM airspace. Such aircraft shall be vertically separated from other traffic by the non-RVSM separation minimum of 2000 feet.

<sup>4</sup> Under certain circumstances, ATS units may temporarily apply increased vertical separation. (e.g. in areas where greater than moderate turbulence has been reported).

4.8. Lateral separation minima are shown in Appendix A **Separation Minima: A.1 Lateral**.

#### LONGITUDINAL SEPARATION

- 4.9. Longitudinal separation shall be applied so that the spacing between the estimated positions of the aircraft being separated is never less than a prescribed minimum (see Figure 1 Longitudinal reduced Separation Minima).
- 4.10. Longitudinal separation minima for aircraft flying along same/intersecting tracks shall be applied by ensuring that throughout the period where lateral separation does not exist the aircraft are separated by a time interval shown in Appendix A **Separation Minima: A.2 Longitudinal time based**.
- 4.11. During the application of distance based separation, when an ADS-C periodic report is not received, the controller shall act within 3 minutes to establish communication. If communication has not been established within 6 minutes of the time the report should have been received, the controller shall take action to apply an alternative form of separation.
- 4.12. -Longitudinal separation minima for aircraft flying along same/intersecting tracks shall be applied by ensuring that throughout the period where lateral separation does not exist, the aircraft are separated by a distance interval shown in Appendix A **Separation Minima: A.3 Longitudinal distance based**.

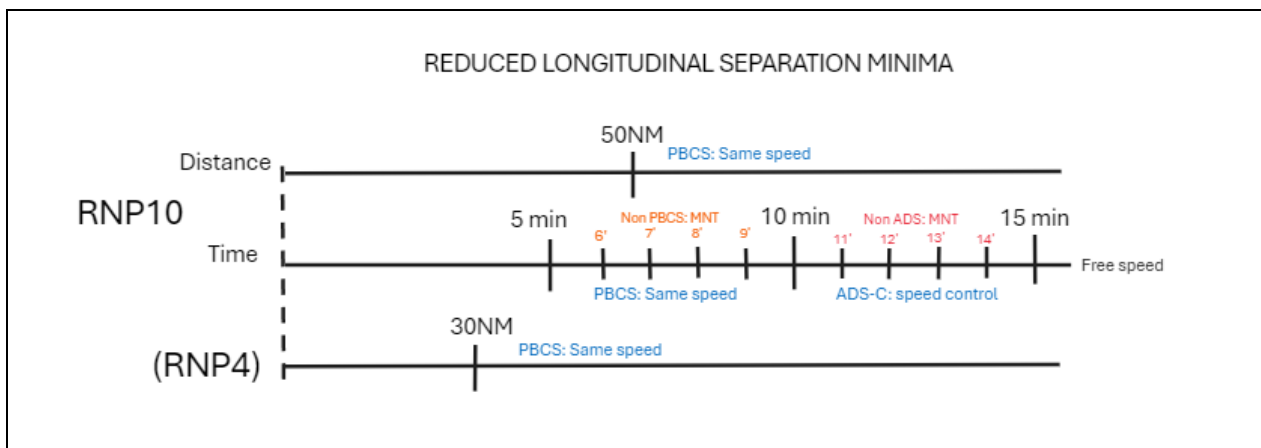


Figure 2 Longitudinal reduced Separation Minima

- 4.13. -Longitudinal separation between aircraft flying along opposite direction tracks (and not laterally separated) cannot apply throughout. Vertical separation must therefore be ensured during a period equal to the appropriate minimum stated in Appendix A **Separation Minima: A.2 Longitudinal time based** prior to and after the aircraft are estimated to meet.
- 4.14. When assigned, any aircraft shall adhere to the true Mach number approved by ATC and shall request ATC approval before making any changes thereto. If it is essential to make an immediate temporary change in the Mach number (e.g. due to turbulence), ATC shall be notified as soon as possible that such a change has been made.
- 4.15. If it is not feasible, due to aircraft performance, to maintain the last assigned true Mach number during en-route climbs and descents, pilots of aircraft concerned shall advise ATC at the time of the climb/descent request.

## APPENDIX A. SEPARATION MINIMA

## A.1 Lateral

Separation Type	LATERAL Non-intersecting								
	ANSP Status				Comms / Navigation / Surveillance Requirements			ICAO References	
	SBAO	GOOO	GVSC	GCCC	C	N	S	PANS	Notes
50NM	YES	YES	YES	YES		RNP 4 or 10		5.4.1.2.1.6	
23NM	-	-	-	-	RCP 240	RNP 4	RSP 180	5.4.1.2.1.8	with PBCS planned for 2026
20 NM	-	-	-	-	RCP 240	RNP 4	ATS Surveillance	8.7.4.1	With ASECNA plans for ASEPS implementation planned for 2026
	LATERAL intersecting								
50NM	YES	YES	YES	YES		RNP 10		5.4.1.2.1.8.b	
23NM	-	-	-	-	RCP 240	RNP 4	RSP 180	5.4.1.2.1.8	with PBCS planned for 2026
	-	-	-	YES	VHF	RNP 2/ GNSS	-	5.4.1.2.1.8	Applied in Canarias, Distance from common point 15NM below FL195
20 NM	-	-	-	-	RCP 240	RNP 4	ATS Surveillance	8.7.4.1	With ASECNA plans for ASEPS implementation planned for 2026



## A.2 Longitudinal time based

Separation Type	LONGITUDINAL Time Same Direction / Crossing Track									
	ANSP Status				Comms / Navigation / Surveillance Requirements			Same Level / climb-descend / Both	ICAO References	
	SBAO	GOOO	GVSC	GCCC	C	N	S		PANS	Notes
15 minutes	YES	YES	YES	YES	HF	-	-	Both	5.4.2.2.1.1.a 5.4.2.2.2.1.a 5.4.2.2.1.2.a 5.4.2.2.2.2.a	This separation would also be used in contingency scenarios
10 minutes (UP TO 89°)	-	-	-	-	HF	NAVAIDS/ GNSS	ADS-C or ATS Surveillance	Both	5.4.2.2.1.1.b 5.4.2.2.2.1.b	ADSC: Contract period: 20 min
10 minutes (MNT)	YES	YES	YES	YES	HF	-	-	Both	5.4.2.4.3.1	Reported common point same track or continuously diverging
Between 9 and 5 minutes (MNT)	YES	YES	YES	YES	HF	-	-	Both	5.4.2.4.3.2	Same track /diverging
5 minutes (UP TO 89°)	-	-	-	-	RCP 240	RNP 2 /4 /10	RSP 180	Both	5.4.2.9.2.b	Contract period: 14 min
	LONGITUDINAL Time Opposite direction									
15 minutes	YES	YES	YES	YES	HF	-	-	Both	n/a	
10 minutes	YES	YES	YES	YES	HF	-	-	Both	5.4.2.2.3	Reported passing over a common point
5 minutes	-	-	-	-	RCP 240	RNP 2 /4 /10	RSP 180	Both	5.4.2.9.3	Contract period: 14 min

### A.3 Longitudinal distance based

Separation Type	LONGITUDINAL Distance Same Direction / Crossing Track									
	ANSP Status				Comms / Navigation / Surveillance Requirements			Same Level / climb-descend / Both	ICAO References	
	SBAO	GOOO	GVSC	GCCC	C	N	S		PANS	Notes
50 NM	-	-	-	-	RCP 240	RNP 4 or 10	RSP 180	Both	5.4.2.9.2.b	Contract period: RNP 4: 32 min RNP 10: 27 min
30 NM	-	-	-	-	RCP 240	RNP 2 or 4	RSP 180	Both	5.4.2.9.2.b	Contract period: 12 min
25 NM	-	-	-	-	RCP 240	RNP 2 /4 /10	ADS-C	Climb/Descend	5.4.2.8.1.b	DECEA implementation planned for April 2026
20 NM	-	-	-	-	VHF	GNSS	ATS Surveillance System	Same Level	5.4.2.3.1	
20 NM	-	-	-	-	RCP 240	RNP 4	ATS Surveillance		8.7.4.1	With ASECNA plans for ASEPS implementation planned for 2026
15 NM	-	-	-	-	RCP 240	RNP 2 /4 /10	ADS-C	Climb/Descend	5.4.2.8.1.b	DECEA implementation planned for April 2026
	LONGITUDINAL Distance Opposite direction									
50 NM	-	-	-	-	RCP 240	RNP 4 or 10	RSP 180	Both	5.4.2.9.3	Contract period: RNP 4: 32 min RNP 10: 27 min
30 NM	-	-	-	-	RCP 240	RNP 2 /4 /10	RSP 180	Both	5.4.2.9.3	Contract period: 12 min

— **END** —