

10SAB07

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Flight crew familiarisation: the application of five minutes for climb/descent between GNSS equipped aircraft in parts of the North Atlantic (NAT) Region



Photo by Capt Andrew Tisdall

The information below has been sent out by the ICAO EUR/NAT Regional Office and offers guidance for five minute separation for climbs and descents between pairs of GNSS equipped aircraft in the North Atlantic (NAT) Region. It is important to note the fact that while the ability to get enroute climbs and descents in the NAT will be enhanced by this procedure, it is imperative to highlight to flight crews that if there is any question as to when the manoeuvre is to be commenced, completed or complied with, they have the ability to reject the clearance either by voice or CPDLC.

This has taken a long standing ICAO procedure for allowing climbs and descents in remote airspace using separation based on a known point between pairs of aircraft. In this case, the NAT will be using a point defined by GNSS equipment rather than VOR DME etc. This guidance documentation should not be confused with five minute longitudinal separation (RLongSM) along the same track. This bulletin represents provisional guidance for flight crews, pending incorporation into the appropriate NAT Region documentation. You are invited to assist in updating this document by providing suggestions, comments, and/or corrections to the European and North Atlantic Office of ICAO via email at icaoearnat@paris.icao.int

Introduction

On 15 January 2009, a new separation minimum was introduced in the following North Atlantic (NAT) oceanic control areas (OCA): Gander, Reykjavik and Santa Maria. The information in this bulletin has been prepared to explain the separation minimum, explain how it will be applied, explain how to comply with the associated air traffic control instructions and explain possible issues that may arise from the implementation.

Flight planning

The new minimum is applied only between Global Navigation Satellite Systems (GNSS) equipped aircraft. In accordance with the procedures for completing the ICAO flight plan (FPL), GNSS equipage may be indicated by inserting the letter "G" in Item 10. In order for ATC to quickly and efficiently apply the new minimum in NAT airspace, it is important that GNSS equipage be indicated in the FPL. Otherwise, flight crews must be queried regarding their equipage and the time taken for this task may make it impossible to subsequently grant the climb or descent.

The minimum

This “5 minutes GNSS” minimum is a variation of a standard that is applied in domestic airspace, outside areas of radar coverage. In domestic airspace, position reports are used to determine the time interval between a pair of aircraft passing over the same location, usually a NAVAID.

Safety studies have confirmed that the accuracy of GNSS navigation and reporting is sufficient to safely use the position reports made by GNSS equipped flights in the NAT Region to apply this standard in oceanic airspace.

To apply the standard, air traffic controllers must:

- a) Verify that the time interval between flights is at least 5 minutes and will be at least 5 minutes during the time when vertical separation does not exist; and
- b) Ensure that the climbing or descending aircraft will commence its vertical manoeuvre no later than 10 minutes after the second aircraft in the pair has passed the common reporting point.

This minimum is essentially a special case which allows air traffic controllers to temporarily reduce the usual longitudinal spacing between aircraft to allow one aircraft to climb or descend through the altitude of another.

Application

In the NAT Region, it is recognized that the use of 3rd party HF communications and Controller Pilot Data Link Communications (CPDLC) could make it difficult for air traffic controllers to ensure that the altitude change will commence within the required 10 minute time frame. As a result, it was determined that restrictions would be included with the clearance if it was issued by a third party or via CPDLC. There are two possible restrictions:

1. an instruction for the flight to leave its current flight level no later than a specified time; or
2. an instruction for the flight to reach its new flight level no later than a specified time.

In the case of the Reykjavik and Santa Maria OCAs, it has been determined that option 2 will be used, because the same restriction can be issued via voice or using standard CPDLC message elements; for example DESCEND TO REACH [altitude] BY [time] or CLIMB TO REACH [altitude] BY [time]. This type of restriction is commonly used in the NAT Region.

In some cases, air traffic controllers will not be permitted to apply this minimum unless the altitude difference between the flights concerned is 4,000 feet or less.

How to comply

As explained above, it is very likely that flight crews will receive a conditional clearance (also known as a restricted clearance) when air traffic controllers are applying this minimum. A significant number of the vertical errors that occur each year in the NAT Region involve incorrect execution of conditional clearances. It is extremely important that flight crews ensure they understand and comply with every condition or restriction contained in the clearance.

Restriction	What is expected
Voice CLIMB TO REACH FLIGHT LEVEL 390 AT OR BEFORE 1325	Arrange the climb so that the aircraft is at FL390 no later than 1325 UTC. If it will not be possible to be level at FL390 at or before 1325 UTC:
CPDLC CLIMB TO REACH F390 BY 1325	Voice Do not commence climb and advise ATC of the situation. CPDLC Do not ACCEPT the clearance; reply UNABLE and do not climb.
Voice DESCEND TO REACH FLIGHT LEVEL 320 AT OR BEFORE 1403	Arrange the descent so that the aircraft is at FL320 no later than 1403 UTC. If it will not be possible to be level at FL320 at or before 1403 UTC:
CPDLC DESCEND TO REACH F320 BY 1403	Voice Do not commence descent and advise ATC of the situation. CPDLC Do not ACCEPT the clearance; reply UNABLE and do not descend.
Voice LEAVE FLIGHT LEVEL 350 AT OR BEFORE 1502	Begin the climb or descent no later than 1502 UTC. If it will not be possible to leave FL350 at or before 1502 UTC:
CPDLC The following NAT Preformatted Freetext CPDLC Message will be used: LEAVE [flight level] AT OR BEFORE [time]	Voice Do not commence climb or descent and advise ATC of the situation. CPDLC Do not ACCEPT the clearance; reply UNABLE and do not climb or descend.

Possible issues

There are some possible issues for flight crews that may arise from the application of this minimum.

Traffic Alert and Collision Avoidance System (TCAS) – This minimum allows air traffic controllers to temporarily reduce the longitudinal spacing significantly. This means that it is possible that flights will detect other flights climbing or descending through their altitude, because the distance could reduce to approximately 40NM. If there is any concern regarding the proximity of another aircraft, flight crews must not hesitate to clarify the situation and take appropriate action to ensure safety of flight.

Differences in application – Different ATC units will apply this minimum differently. This means that it is not possible to provide every potential clearance or restriction that may be used. As well, other operational circumstances may dictate that additional instructions be included with the clearance, making it even less possible to explain every possible clearance or instruction that may be issued. If there is any doubt about the intent of a clearance or a restriction, it is critical to contact ATC, via voice or CPDLC, to confirm the intent.

Examples of clearances

Voice	CPDLC
REYKJAVIK OAC CLEARS AIRLINER 186, CLIMB TO REACH FLIGHT LEVEL 340 AT OR BEFORE 1715. REPORT REACHING	[UM26] CLIMB TO REACH F340 BY 1715 [UM129] REPORT LEVEL F340
AIRLINER 128, AMENDED LEVEL CLEARANCE. SANTA MARIA CLEARS AIRLINER 128 DESCEND TO REACH FLIGHT LEVEL 360 AT OR BEFORE 1245. REPORT REACHING.	[UM28] DESCEND TO REACH F360 BY 1245 [UM129] REPORT LEVEL F360
AIRLINER 47, AMENDED LEVEL CLEARANCE. GANDER CLEARS AIRLINER 47, CLIMB TO AND MAINTAIN FLIGHT LEVEL 380. REPORT REACHING. LEAVE FLIGHT LEVEL 360 AT OR BEFORE 1828.	[UM20] CLIMB TO AND MAINTAIN F380 [UM129] REPORT LEVEL F380 [freetext] LEAVE F360 AT OR BEFORE 1828

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