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Introduction of DME-like GNSS longitudinal separation in the Reykjavik CTA

1 Introduction

In 1996, the International Civil Aviation Organization (ICAO) endorsed the development and use of GNSS as a primary source of future navigation for civil aviation. The potential for the use of GNSS for application of separation was identified by the ICAO Separation and Airspace Safety Panel (SASP) and it has been working on developing GNSS based separation minima since 2002. The first of these is for DME-like GNSS longitudinal separation, which was published in the PANS-ATM (ICAO DOC4444) in November 2007. Utilization of this procedure will enable air traffic controllers in the Reykjavik OACC to separate aircraft using GNSS in a similar manner as has been done for decades using DME. The GNSS longitudinal separation is in effect not a new separation standard, but is rather allowing the use of a different technology (GNSS) to apply the traditional DME distance based separation minima.

2 Purpose of Circular

The circular is intended to advise pilots and aircraft operators of the introduction of this GNSS longitudinal separation within the Reykjavik CTA, the appropriate procedures and aircraft equipage requirements.

3 GNSS Longitudinal Separation Standard

This GNSS longitudinal separation standard is identical to the traditional DME longitudinal separation standard and comprises the following:

- 20NM between aircraft operating on tracks that intersect at 0°-90° angle.
- 10NM between aircraft operating on tracks that intersect at 0°-90° angle provided that the leading aircraft maintains a true airspeed of 20 kt. or more faster than the succeeding aircraft.
- 10NM between aircraft operating on tracks that intersect at 0°-90° angle while one aircraft climbs/descends provided that the other aircraft maintains a level while vertical separation does not exist.
- Vertical separation between aircraft on reciprocal tracks may be discontinued provided the aircraft have passed each other and are at least 10NM apart.

These separation minima may also be applied between a mix of GNSS equipped aircraft and DME equipped aircraft.

4 Communication Requirements and Area of Applicability

Direct controller-pilot VHF voice communication shall be maintained while this separation is used.

This separation may be applied in any portion of the Reykjavik CTA that is served with direct controller-pilot VHF voice communications.

5 Phraseology

It is important that controllers and pilots use standard phraseology when obtaining and giving distance reports. This helps in minimizing the possibility of errors. For this purpose ICAO has created, and published in the PANS-ATM, standard phraseologies for the application of GNSS based longitudinal separation. The standard phraseologies are as follows:

Controller requesting a report at a specified place or distance	REPORT (<i>distance</i>) MILES (GNSS) FROM (<i>significant point</i>)
Pilot response	(<i>distance</i>) MILES (GNSS) FROM (<i>significant point</i>)
Controller requesting a report of present position	REPORT (GNSS) DISTANCE FROM (<i>significant point</i>)
Pilot response	(<i>distance</i>) MILES (GNSS) FROM (<i>significant point</i>).

where (GNSS) is optional.

It is important that pilots keep the following in mind:

1. Always include the name of the applicable significant point when reporting distance from that point.
2. When the controller specifically requests "GNSS distance" then:
 - a. Provide the distance information if your aircraft is equipped in accordance with the Equipment eligibility section below; or
 - b. Advise the controller that you are unable to provide the distance information for reasons such as:
 - the aircraft is not equipped in accordance with the Equipment eligibility section below; or
 - there is no GNSS input into an integrated navigation system; or
 - the distance cannot be provided due to a RAIM warning.

6 Equipment Eligibility

When the controller specifically requests "GNSS distance" then the pilot shall only provide distance information derived from one of the following:

1. A GNSS receiver that is approved in accordance with the requirements specified in TSO C-129a or higher; or
2. An integrated navigation system incorporating GNSS input.

Note! RNAV systems not incorporating GNSS input shall not be used for GNSS longitudinal separation.

7 GNSS Navigation

Compared to conventional avionics receivers such as the DME, GNSS receivers or FMSs incorporating GNSS input function differently, in that they always present distance information in reference to the next waypoint. Once an aircraft passes this waypoint, the GNSS receiver again sequences the next waypoint as the "active" waypoint, and all information displayed is in reference to it. This is referred to as "TO-TO" navigation as opposed to the old "TO-FROM" navigation of VOR/NDB/DME.

In the application of the GNSS longitudinal separation the controller may request the distance from a waypoint that is not the currently-active waypoint in the avionics; it may even be behind the aircraft. Pilots should be able to obtain this information from the avionics. To this end, pilots are reminded to be familiar with their avionics equipment so that this information can be provided as soon as practicable.

8 Effective Date

The application of GNSS longitudinal separation in the Reykjavik CTA will take effect 3 May 2009 at 0901 Coordinated Universal Time (UTC).

For any further information contact procedures@isavia.is

9 Abbreviations

CTA	Control Area
DME	Distance Measuring Equipment
FMS	Flight Management System
GNSS	Global Navigation Satellite System
ICAO	International Civil Aviation Organization
NDB	Non-Directional Beacon
OACC	Oceanic and Area Control Centre
PANS-ATM	Procedures for Air Navigation Services - Air Traffic Management
RAIM	Receiver Autonomous Integrity Monitoring
RNAV	Area Navigation
SASP	Separation and Airspace Safety Panel
VHF	Very High Frequency
VOR	Very High Frequency Omnidirectional Radio Range

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