Compliance with ICAO SARPS for RNAV GNSS Instrument Approach Procedures supporting LNAV and LNAV/VNAV

1. Introduction

1.1 RNAV GNSS Instrument Approach Procedures supporting LNAV and LNAV/VNAV require an assessment of the compliance of the GPS Signal in Space (SiS) with ICAO Annex 10 Volume 1 Radio Navigation Aids - SiS performance requirements detailed in table 3.7.2.4-1.

Note LNAV and LNAV/VNAV refer to Non-Precision Approach and APV BARO VNAV respectively. The Non-Precision Approach requirements in table 3.7.2.4-1 apply to the lateral aspects of both types of approach.

2. Scope

2.1 This paper provides guidance on how Air Traffic Service (ATS) providers can assess the compliance of the GPS SiS with the SARPs of ICAO Annex 10 Volume 1 Radio Navigation Aids table 3.7.2.4-1. Signal in Space Performance Requirements.

3 Requirements

3.1 Continuity - An ATS provider shall derive a continuity requirement in the range of values between $1\text{-}1\text{x}10^{-4}$/h to $1\text{-}1\text{x}10^{-8}$/h.

> **Note**: Guidance on how to set the specific value can be found in ICAO Annex 10 Attachment D section 3.4.2.1.

3.2 Continuity - An ATS provider shall ensure that the GPS SiS performance meets the derived continuity requirement.

> **Note**: loss of continuity is considered to be when the horizontal alert limit (556m) cannot be achieved for 10 Seconds or more, during a period when Receiver Autonomous Integrity Monitor (RAIM) is predicted to be available.

3.3 Horizontal Accuracy - An ATS provider shall ensure that the GPS SiS Horizontal Accuracy is better than 220 m.

3.4 Integrity - An ATS provider shall ensure that the GPS SiS continuity performance meets a probability of 1-(1x10-4/h).

> **Note**: The integrity requirement is based upon the combination of the minimum performance of the receiver RAIM algorithm as specified in RTCA DO -208 and the GPS continuity performance.

4. Acceptable Means of demonstrating compliance with the ICAO Signal in Space Performance Requirements

4.1 The CAA has contracted a third party to monitor and analyse the performance of the GPS SiS both by direct monitoring and analysis of NANUs, and provide reports on a regular basis.

4.2 These reports can be used by Air Traffic Service providers to assess the ongoing SARPs compliance.

4.3 It is reasonable to claim that this monitoring would be representative of all UK locations where terrain masking is not an issue.

5. References

a) ICAO Annex 10 Volume 1 Radio Navigation Aids

6. Queries

Any queries or further guidance required should be addressed to:

ATS Enquiries

Air Traffic Standards Division

CAA Safety Regulation Group

2W Aviation House

Gatwick Airport South

West Sussex RH6 0YR

E-mail: ats.enquiries@caa.co.uk