

Assessing the Availability of the Modernized GNSS to achieve GAST-D/F Requirements in GBAS Landing Systems

In the Global Navigational Satellite System (GNSS) aviation world, the Ground-Based Augmentation System (GBAS) Landing system has recently been approved as CAT II performance (equivalent to GBAS Approach Type D (GAST-D)) for the precision approach landing and take-off operations using the GNSS technology, the standard requirements were provisioned in ICAO Annex 10 using a single GPS constellation signals only. Yet, the System Design Approval (SDA) of GBAS systems is supposed to meet those requirements accordingly before its deployment and operation. Furthermore, the requirements of CAT III performance (GAST-F) are tended to be approved using dual Constellation by adding the European Galileo system's signals in the near future. In this research, an assessment of the availability parameters for CAT II/III performance is conducted by using the upcoming Galileo constellation signals only and over Europe Only. A simulation tool was used to estimate to which level of integrity and accuracy is needed to meet the requirements of current approved CAT II performance and the intended future requirements of CAT III, considering the new Binary Offset Carrier (BOC) and the +6dB Galileo signals. The results showed a promising better and a more stable performance of achieving those requirements over Europe space compared with GPS system performance.

Key Words: GNSS GPS, Galileo, GBAS, GAST-D, GAST-F, CAT II, CAT III.

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