

INDRA SUCCESSFULLY COMPLETES GBAS FLIGHT TRIALS WITH HONG KONG CAD

- **Indra has successfully completed flight trials of Ground Based Augmentation System (GBAS) for the Civil Aviation Department (CAD) at Hong Kong International Airport (HKIA)**
- **Performed with Indra's NORMARC GBAS ground equipment, they ran smoothly both technically and operationally. GBAS landing system approaches were flown by Cathay Pacific Boeing 747-8 freighters**
- **Trials at one of the world's leading airports marks a milestone in making satellite-based landing systems the industry standard, leading to potential environmental and cost benefits**
- **Indra has worked with satellite-based landing systems since 1997, and is proactively working towards having GBAS GAST D approved for Category III operations**

Asker, Norway. March 7, 2019.- GBAS flight trials have been successfully carried out by Indra at Hong Kong International Airport (HKIA) for the Civil Aviation Department of Hong Kong. The flight trials, which took place during November and early December 2018, mark a new milestone in the path towards making GBAS the standard for landing systems.

Indra's NORMARC GBAS ground equipment was used for the flight trials, and the company was also responsible for providing flight procedures and ionospheric analysis, with IDS (Ingegneria Dei Sistemi) and the German Aerospace Center (DLR) as subcontractors.

Flight inspection verified that the GBAS performance met the intended operational requirements. Four required navigation performance (RNP) to GBAS landing system approach procedures were designed and validated by flight check to demonstrate GBAS' capability, with three of the procedures targeted for the purpose of flight trials.

Following the successful flight inspection and flight procedure validation, demonstrations were flown by Cathay Pacific Boeing 747-8 freighters, with satisfactory results and positive feedback from pilots.

"The flight trials have been successful, both technically and operationally, and show that it is realistic to implement GBAS in this region. Indra believes GBAS will provide airports and airlines with significant cost, capacity and environmental benefits. In this respect, we regard the project in Hong Kong as important for the entire industry. We wish to thank CAD and Cathay Pacific for acting as pioneers, and for such a professional and efficient organization of a challenging endeavor", says Linda Lavik, Product Manager at Indra.

GBAS provides accurate and flexible navigational guidance to aircraft, allowing steeper and shorter approaches. With potentially 48 approaches from one system and no sensitive areas, GBAS is expected to initially supplement conventional instrument landing systems (ILS) for resilience, improved efficiency and operational flexibility. Indra's NORMARC GBAS system is capable of guiding aircraft in CAT III low visibility conditions.

Indra was the first company to start delivery of commercially operational satellite landing systems, used in Norway since 2007. "Indra is working proactively to get GBAS GAST D approved for Category III operations. After ICAO requirements for GAST D became effective in November 2018, we are confident an approval is realistic", comments Linda Lavik.

The Civil Aviation Department of Hong Kong regulates the civil aviation activities and is the air navigation service provider in Hong Kong. In 2018, Hong Kong International Airport (HKIA) handled 74.7 million passengers and 427,725 flight movements. HKIA was also recognized as the "Airport of the Year 2018" by Air Transport World and "Best Global Airport" at the Asian Freight, Logistics and Supply Chain Awards by Asia Cargo News.

About Indra

Indra (www.indracompany.com) is one of the leading global technology and consulting companies and the technological partner for core business operations of its customers world-wide. It is a world-leader in providing proprietary solutions in specific segments in Transport and Defense markets, and a leading firm in Digital Transformation Consultancy and Information Technologies in Spain and Latin America through its affiliate Minsait. Its business model is based on a comprehensive range of proprietary products, with a high-value focus and with a high innovation component. In the 2018 financial year, Indra achieved revenue of €3.104 billion, with 43,000 employees, a local presence in 46 countries and business operations in over 140 countries.