



## **Project LINA** **(Local Integrity Navigation Augmentation)**

### **Overview:**

LINA is a research project co-funded by the BMWi as part of the national Luftfahrtforschungsprogramm 2007-2012 and is dealing with the local augmentation of GPS to enhance precision and in particular the integrity of the positioning service for aviation applications. The overall activity comprises the ground segment of a Ground Based Augmentation System (GBAS), as well as a prototype on-board equipment for GBAS precision approach. LINA started in 2007 and will be closed in 2010.

### **Consortium:**

LINA is coordinated by THALES ATM GmbH. Euro Telematik is responsible for the sub-project on the on-board equipment. The Technical University of Braunschweig (Institut für Flugführung), as well as the German Aerospace Centre DLR (Institut für Kommunikation und Navigation, and Institut für Flugführung) are contributing as subcontractors.

### **Project Description:**

The availability of satellite navigation is leading to the incremental transition from conventional ground-based navigation aids towards navigation based on satellites. The requirements for the navigation system vary according to the flight phase. The requirements for the precision approach under bad weather conditions are particularly stringent. The flight phases en-route up to the lateral guidance for non-precision approaches are already covered today by GPS and receiver autonomous integrity monitoring. Space based navigation systems (SBAS) are used for non-precision approach with vertical guidance. Precision approaches will be done using ground-based augmentation systems (GBAS) which are the topic of LINA.

On one hand, LINA addresses the THALES ground system, which shall be upgraded to comply with the PA (CAT-I) requirements with the growth potential for CAT-II/III approaches. A safety assessment and a system test are part of this project part. Euro Telematik will implement a CAT-I on-board equipment for general aviation, with complementing analyses and trials.

### **Role of Euro Telematik:**

The Euro Telematik work addresses the on-board avionics. The main goals are:

- Development of a prototype SBAS/GBAS on-board equipment for General Aviation to support satellite navigation based approaches up to CAT-I.
- Concept verification and validation during two flight trials on the IFF DO-128 and, finally, on the DLR A320.
- Analysis of the enablers and the steps necessary for the additional introduction of the Galileo Safety-of-Life service into the GBAS application..