

# EGNOS V3: Engineering the Future of GPS and Galileo Augmentation Over Europe

Jean-Alexandre Gicquel, David Arnaudy and Philippe Gouni

**Abstract** EGNOS provides today augmentation services based on GPS. It allows getting improved performances in a wide range of navigation applications, in particular for aeronautical approaches in the civil aviation domain. In parallel, GPS, Galileo and other constellations are evolving, and new services are identified to serve European users communities, answering to the emergence of new end-users applications needs, finally calling for the EGNOS V3 generation. In the area of navigation, EGNOS is designed to support Safety of Life applications, with stringent aeronautical performance requirements. In the same time, continuity of the EGNOS service to end users when evolving and security aspects of the solution shall be ensured, and furthermore, the solution is required to have improved operability and reduced lifecycle cost, that implies to pay specific attention in operations design. This paper provides an overview on how the Thales Model Based System Engineering (MBSE) methodology and tools are tailored and applied to support EGNOS V3 engineering objectives. A toolled-up environment is set-up to support concurrent engineering on a common design reference and to contribute to the consolidation and justification of the EGNOS V3 system architecture design and requirements. The resulting work organization and interactions between system engineering team and engineering domain specialists (safety, security, operations...) are presented. Finally, this paper is providing lessons learned and success stories of a model based approach to federate concurrent engineering activities, identifying the main outcomes and benefits.

---

J.-A. Gicquel · D. Arnaudy · P. Gouni (✉)

Observation Exploration and Navigation Business Line/Navigation Domain,  
Thales Alenia Space, Toulouse, France  
e-mail: Philippe.gouni@thalesaleniaspace.com