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GALILEO RETURN LINK SERVICE IN OPERATIONS, PAVING THE WAY TO A FUTURE GLOBAL EMERGENCY SATELLITE SYSTEM?

Abstract

In January 2020, the Galileo Programme announced the start of operations of its new functionality for Global Search and Rescue (SAR) applications: A Return Link capability through its navigation signal in space. This new and unique feature provided by Galileo allows reaching any user in the world activating an emergency distress beacon to inform him that its distress has been well localized by the Galileo Search and Rescue service or any other system contributing to Cospas-Sarsat. The establishment of this new functionality opens new doors for the future Emergency Warning Service envisaged by the European Union in the frame of its Galileo Programme. Indeed, through a similar data dissemination mechanism as the SAR Return Link, the possibility to create in the near future a global emergency satellite system (GESS) capability on Galileo has never been so close. The current Galileo SAR Return Link already offers extremely impressive performances in terms of latency for the delivery acknowledgment messages from its ground operations centre, named Return Link Service Provider, located in Toulouse. Indeed, while the system specifications for message delivery through the Galileo Signal in Space (SIS) were set to 15 minutes, the system offers todays latencies in the order of 2-3 minutes and targets even lower in the future upgrades on the ground segment. Latency is a key performance parameters to establish a useful global Emergency Warning Service as it is most often in matter of minutes that citizen need to be informed about a catastrophic events (tsunami, earthquake, fire...) and any minute gained means additional saved lives. Another important aspect which is at stake when establishing an emergency warning service, is the integrity and authentication of the transmitted message that guarantees the latter has been sent by trusted authorities and does not constitute a false alert. In order to address the more general matter of signal and navigation message authentication, the Galileo Programme intends to ensure the delivery of an operational OSNMA (Open Service Navigation Message Authentication) before the end of 2021 with the capability to relay an authenticated message for SAR return link and emergency warning messages. The paper introduces the on-going operational Galileo SAR Return Link functionality, its performances and operations and explains how the current set-up can be used for a gradual deployment of the Global Ermergency Satellite System (GESS) using Galileo, covering both SAR and EWS applications. It discusses the key performances parameters and possible implementation architectures. The future short and medium terms plans, including planned real case demonstrations are also addressed in this paper.