E-GNSS IN RAIL SIGNALLING ROADMAP

GSA | GSA ACTIVITIES FUNDAMENTAL ELEMENTS | INDUSTRY / EXTERNAL STAKEHOLDERS
GSA ACTIVITIES H2020 | ESA ACTIVITIES | ERA & INDUSTRY WITH EXTERNAL GSA SUPPORT

GSA/ERA
Support UNISIG, Next Generation Train Control & S2R activities from GNSS perspective through H2020, consultancy and involvement of experts and institutions from GNSS fields (ESA, JRC, ESSP...)

ESA
Support GNSS and Rail stakeholders in coordination with GSA in the field of user requirements, architecture and system concept design, and laboratory testing, especially in connection with receiver development

ERSAT
Verification of E-GNSS suitability for safety railway application in the Low-density line scenario

SHIFT2RAIL IP 2
Finalisation of GNSS-based Train Positioning architecture

3INSAT
Demonstration of SatNav & SatCom use on Low-density lines

RHINOS
International collaboration project to develop a Railway High Integrity Navigation Overlay System for rail

H2020
Application oriented H2020 projects in 3rd / 4th call

Availability of GNSS enabled and certifiable train positioning system for ERTMS

GALOROI/SATLOC
Definition of concept, architecture and demonstration of potential E-GNSS application in rail

NGTC
Definition and quantification of GNSS parameters relevant for the signalling application in railway environment

STARS
The assessment of the E-GNSS performances achievable in the railway environment with the determination of the applicable requirements for the positioning system as well as the necessary evolutions of E-GNSS services and ERTMS/ETCS functions

RECEIVER DEVELOPMENT
GSA **Fundamental Elements** programme-Receiver development

SIMULATION TESTBED
Testbed setup and development of methodology for evaluation of GNSS performance

Provision of technical support regarding receiver testing and development

Development of railway GNSS receiver chain technology enabler to support receiver testing and algorithm validation

CBA
Based on pre-final technical solution and operational scenarios (GSA SC)

CERTIFICATION
Development of the rail certification roadmap

Implementation of the certification roadmap, opening doors to potential certification of GNSS components of the train positioning subsystem in collaboration with the ERA

DG GROW/ DG MOVE
Establish a collaboration platform between DG MOVE and DG GROW to support E-GNSS inclusion in ERTMS

UNISIG
Performance tests in frame of R&D and joint activities with UNISIG (H2020 2nd call STARS):
- Definition of railway environment regarding future use of E-GNSS
- Validation of E-GNSS performance in georefenced rail environment (focus on EGNOS & integrity)
- Analysis of multipath and its impact on safety

UNISIG/ RAIL SECTOR
Finalisation of user requirements on GNSS receiver

Finalisation of train positioning subsystem architecture using GNSS

ERA/UNISIG
Implementation of technical solution into ERTMS specifications

2015 2016 2017 2018 2019 2020

THE EUROPEAN GNSS AGENCY IS WORKING TOGETHER WITH RAIL AND SPACE INDUSTRY STAKEHOLDERS TO ENABLE THE USE OF SATELLITE-BASED POSITIONING FOR RAILWAY SIGNALLING

At the heart of this multi-stakeholder initiative lies the European Train Control System (ETCS), which is now being adopted both in Europe and beyond, as one of the components of the European Rail Traffic Management System (ERTMS). At present, in ETCS the positioning of the train is based on "balise", a physical element mounted at specific intervals along the railway track. The goal is to ensure that wherever possible, the physical balises can be replaced by virtual ones, based on precise, GNSS-based positioning without any operational or safety implications on the ETCS. The roadmap below summarises the main projects currently running and planned, as well as the involvement of the various stakeholders interested to achieve the objective of E-GNSS enabled ETCS together with the GSA.

GALILEO EGNOS NAVIGATION SOLUTIONS POWERED BY EUROPE

European Global Navigation Satellite Systems Agency

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