Galileo Programme Status

UTOKYO/ICG GNSS Training

Dominic HAYES, European Commission (EC)
Performance Above All

Ranging Accuracy, 95% @ AUL - Dual-Frequency - June 2023

- **BEST SV**
  - GAL E1/E5a: 0.17
  - GAL E1/E5b: 0.14
  - GPS L1/L2: 0.39
  - GLO G1/G2: 0.67
  - BDS B12/B3: 2.14
  - BDS B12/B2b2: 2.40

- **WORST SV**
  - GAL E1/E5a: 0.31
  - GAL E1/E5b: 0.31
  - GPS L1/L2: 2.42
  - GLO G1/G2: 7.37
  - BDS B12/B3: 4.01
  - BDS B12/B2b2: 5.02

- **CONST. AVERAGE**
  - GAL E1/E5a: 0.21
  - GAL E1/E5b: 0.18
  - GPS L1/L2: 0.82
  - GLO G1/G2: 1.88
  - BDS B12/B3: 4.02
  - BDS B12/B2b2: 3.71

Overall SATISFACTION with Galileo continue to grow: 82.35%
Expanded and Strengthened Ground Infrastructure

- New release for End 2023 (Focus on PRS and Cyber)
- Deployment of New Sensor and TT&C Stations
Launchers

• Two delayed launches to reach Galileo FOC constellation level
• Further enhanced deployments planned with Ariane 6
  • Maiden Flight postponed to mid-2024
• Out-of-EU solution for next two launches - SpaceX
• Required a security agreement
  Spring and autumn 2024 timeframe
• Aiming for full constellation with adequate redundancy
INAV Improvements and New Pilot Signal

- New Reduced Clock and Ephemeris Data
- Reed Solomon Outer Forward Error Correction
- Secondary Synchronisation Pattern

INAV = Faster TTFF, simplified acquisition, and increased robustness

- New Test signals on GSAT 201 and 202
- Pilot Signal on E5

= Faster E5 acquisition and better single frequency potential
### Highest Accuracy

- **High Accuracy** Initial Service Declared in early 2023 – one year of service

- Very good performance since then!

- Excellent feedback and interest for the internet distribution service.

- Start of HAS Phase 2 implementation actions
Emergency Warning Satellite Service

Showcase the end-to-end concept
Show user interfaces, functionalities, devices, infrastructures, performance

Consolidate the service concept
Collect feedback from civil protection authorities, to improve the initial service concept

Support the adoption by the civil protection authorities
Build awareness, generate interest, establish credibility
Explain users’ duties and obligations, interface requirements, service limitation
Remote Beacon Activation
– EUROCAE standard approved
– Under consolidation

Two Way Communication
– Enabled by the long Return Link Message
– Based on predefined Q&A helping the rescue mission

Distress Position Sharing
– Rescue Centres can contact Galileo to share the position of a beacon user in distress with other nearby users
– Enable quicker rescue deployment thanks to nearby users

New MEOLUT In Reunion Island
Improves SAR coverage reliability in the Indian Ocean region

Pilot services planned for both, 2025
The Spoofing Challenge

- **OS NMA - Long awaited GNSS feature**

- Final OSNMA SIS ICD and receiver guidelines published in late 2022

- Transition to final signal broadcast in July 2023.

- Public Key Infrastructure under finalisation

- Initial Service declaration planned for early 2024

- First OSNMA receivers on the market
Galileo 2\textsuperscript{nd} Generation

- Robustness
- New Signals
- More Data Capacity
- Flexibility
- Backward Compatibility
- New and Improved Services
- State of the Art Technology
Future Evolution

- LEO
- New Clocks
- SoL Services
- Secured Connectivity
- Quantum
- New Governmental Services
Support Galileo Global Users

And many more Galileo enabled devices
Find you Galileo enabled device at www.useGalileo.eu

Download the new EO and GNSS EUSPA Market report www.euspa.europa.eu