

# EUROPEAN SPACE WEEK

#EUSpaceWeek

ONLINE EDITION

## *Space Users* Panel Discussions Results Summary

User Consultation Platform 2020

2<sup>nd</sup> December, 2020

Organised by:



European  
Global Navigation  
Satellite Systems  
Agency



Under the auspices of:



EU Space Programme:



Copernicus

EGNOS



# Items

- Highlights of Main Trends in the Market
- Requirements Analysis Context
- Recommended Refinements of Segmentation
- Recommended Refinements of User Requirements
- Discussion on EGNSS Services
- Research and Innovation Priorities

# Programme

14h00 – 14h10	Opening: An overview of the market segment and applications
14h10 – 16h10	Space Segment User Needs and Requirements discussion - moderated by <b>Omar Valdés</b> (GSA)
16h10 – 16h20	- Break -
16h20 – 16h40	The Galileo SSV Service - <b>Juan Pablo Boyero</b> (European Commission)
16h40 – 17h00	<i>“The Interoperable Global Navigation Satellite Systems Space Service Volume Booklet”</i> - Preparation of the next issue, to be published by the United Nations Office for Outer Space Affairs - <b>Prof. Dr. Werner Enderle</b> (ESA)
17h00 – 17h30	R&D projects’ pitch: ENSPACE - <b>Samuele Fantinato</b> (Qascom)
17h30 – 18h00	Minutes of Meeting & Presentation for plenary

# Highlights of Main Market Trends

- **NewSpace:** new users; increasingly commercial activities; faster, cheaper and easier access to space; increasing number of satellites)
- **Megaconstellations:** several projects revolutionizing the use of outer space
- **Space Service Volume (SSV) Definition and Extension:** from LEO to cis-lunar areas
- **Space Situational Awareness (SSA):** space debris removal; collision avoidance
- **Multiple GNSS Benefits:** savings on missions costs; improved navigation performances; new missions' opportunities; increased density on GEO belt
- **Security** concerns: critical for launchers, growing interest for Earth orbiting satellites

# Requirements Analysis Context

- First UCP Space Users forum
- No existing « *Report on User Requirements (RUR)* »
- First publication of a RUR expected in 2021
- Presented requirements taken from the EC GENESIS project (literature review and direct user consultation )

**GENESIS Project: R&D for a  
Galileo Space Service**  
Space User Requirements (SUR)

# Recommended Refinements of Segmentation

- Precise Orbit Determination (POD)
  - Precise Orbit Determination - LEO
  - Precise Orbit Determination - CubeSats
  - Precise Orbit Determination - GTO
  - Precise Orbit Determination - HEO
- Formation Flying
- Rendezvous and Docking
- GEO Station Keeping
- Radio Occultation
- Reflectometry

- Timing
- Launchers
- Attitude determination

Insights gathered live through  
**slido** & verbal discussion

To be potentially added to the segmentation

- + Lunar & cis-lunar missions
- + Space debris removal
- + Altimetry, Scatterometry

# Recommended Refinements of User Requirements

The scope of functional requirements shall be extended:

- Existing requirements (multi-frequency, precise real-time ephemeris, precise real-time clock products, access to UTC) shall concerns more applications
- New requirements shall be expressed including:

Insights gathered  
live through

**slido**

& verbal discussion

- + Wide Space Service Volume (SSV)
- + Anti-jamming and Anti-spoofing receivers
- + Robustness, Fail-safe designs (high dependability and internal auto-validation)
- + Data on Tx antenna patterns

# Recommended Refinements of User Requirements

- **3D Positioning:**

- 10 URs out of 14 covered by an accuracy of **3.5 meters** (identified as the key 3D positioning requirement for Space Users), while the 4 more stringent requirements ask for 60 cm or below.

- **3D Velocity:**

- No comments on 6 requirements ranging from 0.2 m/s to 1 mm/s

Insights gathered live through **slido** & verbal discussion

New applications could be considered:

- + Launchers Re-entry
- + Landing Capabilities (e.g. Space X)
- + Rendezvous with uncooperative target (e.g. space debris capture)
- + Collision Avoidance

New applications could be considered:

- + GNSS altimetry for which the vertical component is more critical than the lateral one.



# Recommended Refinements of User Requirements

- **Timing:**
  - 5 requirements, ranging from 750 ns to 20 ns.
  - 4 of them already covered by Galileo (30 ns).
  - Only 1 more stringent: POD for CubeSats – 20 ns.
  - Timing requirements figures should be explained further in the upcoming RUR document.

# Discussion on EGNSS Services

- OS-NMA: Most appropriate performance parameters to define authentication for Space Users:

Insights gathered  
live through

**slido**

& verbal discussion

- + Latency
- + Availability
- + Update rate (in particular due to high dynamics)
- + TTA

# Research and Innovation Priorities

- Emerging EGNSS applications using synergies with Earth Observation?
- Financing tools could be used to support further market uptake of applications for Space Users?
- Large implementation projects emerging in the Space Users market segment?

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→ Disaster Management

→ Grants, Procurements, Venture Capitals

→ Testing Facilities

→ Joint tenders with other agencies (e.g. ESA)

→ Megaconstellations

→ Cis-lunar missions

→ Space debris clean-up operations

With the contribution of:



# Linking space to user needs



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