

ICG WORKING GROUP S
Systems, Signals, and Services
ICG-19 Meeting

Busan, Republic of Korea
21-23 October 2025
AGENDA (as of 16 October 2025)
(Note: All times are local Busan)

Tuesday, 21 October

1050-1115 Introduction

- 1) WG-S Co-chairs Opening Remarks
- 2) Approval of the Agenda
- 3) WG-S Events in 2025

1115-1200 GNSS System Provider Updates*

- 1) BeiDou (BDS)
- 2) Galileo
- 3) GLONASS
- 4) GPS
- 5) IRNSS/NAVIC
 - a. Channel codec candidate for future NavIC signals
Neeraj MISHRA, Deepak MISHRA, India
 - b. Navigation Service Demonstration In Highly Eccentric GT Orbit
D RAJARAJAN , Kalpana SAMAL , Umesh SWAMI, Babu R, K RAJAJAHA, AKIHILESH, India
 - c. Coverage and Throughput Analysis of New NavIC Value Added Service
Kalangi Sai BHANUMATHI, Vijay Singh BHADOURIA, India
- 6) KPS
 - a. KPS Signal Design for MLS & EWS - complementary with GPS L1C
DeokWon LIM, JaeHee NOH, Republic of Korea
- 7) QZSS

PROVISIONAL AGENDA

- * Note: This is an opportunity for group discussion on any information relevant to WG-S that requires clarification or elaboration based on the system provider updates presented in the plenary session on Monday, 20 October.

1200-1230 Interoperability & Service Standards (*Open Service Standards*)

1) PRESENTATIONS

TBD

2) Update from the Performance Standards Team

Alexey BOLKUNOV, Russia & Sasha MITELMAN, U.S.

3) Update "Dream Team" Members/Participants List

4) Review recommendations, actions and next steps

NEW DRAFT WG-S RECOMMENDATION (for consideration)

ICG Members should consider sharing the Performance Standards Guidelines Document with LEO PNT Providers and encourage further discussion on this topic in future workshops

1230-1300 GNSS Compatibility & Spectrum (*Signal Compatibility and Spectrum Protection*)

1) PRESENTATIONS

- a. RF compatibility analysis of New NavIC Service Signals in L1 and L2 Frequency Bands

Vijay Singh BHADOURIA, Kalangi Sai BHANUMATHI, Dhaval UPADHYAY, INDIA

- b. Performance verification and validation of Multi-Frequency MCEMIC modulation for future NavIC signals

Harsh AGARAWAL, Anand Mohan ROY, India

2) Compatibility and Spectrum Subgroup Update

Dominic HAYES, EU & Takahiro MITOME, Japan

3) Update Subgroup Members/Participants List

4) Review recommendations and actions

1300-1400 Lunch

1400-1500 GNSS Compatibility & Spectrum (*IDM Standards and Information Exchange*)

1) PRESENTATIONS

- a. FHBOC Modulation Scheme for Next Generation GNSS Signals for Jamming Resilience and Improved RMS Bandwidth

Rohan URDHWARESHE, Rakesh Kumar BIJARNIYA, Krunal KOLHATKAR, Apurv VASAL, India

- b. Update on IDM Recommendations from August Workshop

Jeremy BENNINGTON, U.S./Spirent

2) Review previous recommendations, actions and next steps

3) IDM Task Force Report: IDM Workshop Summary

James AVILES, U.S. & Weimin ZHEN, China

- a. Actions/New Recommendation

NEW DRAFT WG-S RECOMMENDATION (for consideration)

ICG encourages member states to consider [use of/resourcing/deploying] national and/or global interference monitoring to ensure users know where interference will cause GNSS/RNSS to be unavailable (jammed) or errant (spoofed).

- b. Next IDM Workshop

4) Update Task Force Members/Participants List

1500-1540 Interoperability & Service Standards (*Precise Point Positioning (PPP) Interoperability*)

1) PRESENTATIONS

- a. QZSS PPP/PPP-RTK Status

Yoko SAKAI, Hiroyuki MINEYAMA, Japan

- b. Galileo HAS Status

Ignacio FERNANDEZ HERNANDEZ, EU

- c. BDS PPP Service Status Update

Nie XIN, China

- d. PPP via South PAN

PROVISIONAL AGENDA

Ken HARIMA, Australia and New Zealand

2) Update from the PPP Task Force (WG-S)

Rui HIROKAWA, Japan, Ken HARIMA, Australia & Ignacio

FERNANDEZ-HERNANDEZ, EU

3) Update Task Force distribution list

4) Review actions and next steps

a. Next workshop

1540-1600 Coffee Break

1600-1700 LEO PNT

1) PRESENTATIONS

a. ESA's view on creation of a LEO-PNT interoperability and compatibility document

Roberto PRIETO CERDEIRA, ESA

2) Summary of 2025 LEO PNT Workshop

China, ESA, U.S., Tri-organizers

3) Actions, recommendations, and next steps

NEW DRAFT WG-S RECOMMENDATION (for consideration)

The Working Group on Systems, Signals and Services (WG-S) will establish a Task Force (TF) on LEO PNT.

- ____ will provide the co-chairs of the Task Force

Specifically, the Task Force will:

- Complete the effort to capture future work in a document to be developed within the WG-S ("LEO-PNT Systems Compatibility and Interoperability Document")
- Prepare technical presentation on topics related to LEO-PNT compatibility and Interoperability, to be given upcoming session of the "Spectrum and Compatibility" and "Interoperability and Standards" subgroups
- Organize annual LEO PNT Workshops to be held during the intersession time

1700-1730 Civil Signal Authentication

1) PRESENTATIONS

a. QZSS Message Authentication Service Status

Yoko SAKAI, Hiroyuki MINEYAMA, Japan

- 2) Review actions and next steps

1730-1800 System-of-Systems Operation (Orbital Debris Mitigation)

- 1) PRESENTATIONS

- a. Update of Study on Disposal options of BDS EOL Satellites

Jing ZHOU, China

- 2) Discussion on IADC Report (November 2020)

ACTION to Working Group: WG-S to prepare a response to IADC with feedback on the report. Working Group members should complete the draft template on orbit plans that was presented by China and be prepared to discuss at the next WG-S meeting.

- 3) Review actions and next steps

Wednesday, 22 October

0900-1000 Joint Session with WG-L

Lunar PNT GNSS Compatibility and Spectrum (led by WG-L)

- 1) Presentations from WG-L
- 2) Discussion on strategy for future engagement with WG-L on this topic

1000-1100 Joint Session with WG-D

Multi-GNSS Timing Interoperability (led by Timing Experts)

- 1) Review previous discussions, actions, recommendations from WG-S and WG-D
- 2) PRESENTATIONS
- 3) Update timing experts' distribution list
- 4) New actions and next steps

TBD

International GNSS Monitoring and Assessment (IMGA) (WG-S lead)

1) PRESENTATIONS

TBD

2) Report of the IGMA Task Force (WG-S)

Satoshi KOGURE, Shuli SONG, Erik SCHONEMANN

3) Update Task Force distribution list

4) Review actions recommendations and next steps

1100-1120 Coffee Break

1120-1200 GNSS Compatibility & Spectrum Wrap-up

1) Summary Report of the Compatibility & Spectrum Subgroup

Dominic HAYES, EU & Takahiro MITOME, Japan

1200-1230 Interoperability & Service Standards Wrap-up

1) Summary Report of the Interoperability & Service Standards Subgroup

Jeff AUERBACH, U.S. & Xiaochun LU, China

1230-1330 Lunch

Thursday, 23 October

0900-0930 Refinement of the WG-S Report to the Committee and Providers Forum

0930-1030 *Review and Consensus on Working Group Actions and Recommendations; Review Final WG-S Report to the Committee and Providers Forum*

PROVISIONAL AGENDA

- 1) Compatibility and Spectrum Actions and Recommendations

Igor LARIN & Jeff AUERBACH

- 2) Interoperability and Service Provision Actions and Recommendations

Igor LARIN & Jeff AUERBACH

- 3) Other Recommendations/Actions

- 4) Review of Co-Chairs Presentation to the ICG Plenary

- 5) Possible Times and Locations for Intersessional Meeting(s)

- 6) Closing Remarks

Igor LARIN & Jeff AUERBACH

1030-1100 Coffee Break