

ICG WORKING GROUP S
Systems, Signals, and Services
ICG-17 Meeting

Madrid, Spain
17-19 October 2023
AGENDA (as of 16 October 2023)
(Note: All times are local Madrid)

Tuesday, 17 October

0900-0915 Introduction

- 1) WG-S Co-chairs Opening Remarks
- 2) Approval of the Agenda
- 3) WG-S Events in 2023

0915-1015 GNSS System Provider Updates*

- 1) BeiDou (BDS)
- 2) Galileo
 - a. The Improvements seen from Galileo's Signal Message I/NAV changes
S. WALLNER, ESA
- 3) GLONASS
- 4) GPS
- 5) IRNSS/NAVIC
 - a. NVS-01 performance: L1 Signal, Data & Indigenous Atomic Clock
Kaitha RAJAH, Umesh SWAMI, India
 - b. Study on feasibility of incorporating SBAS payload in NavIC satellites
Anand DWIVEDI, Ranjith V, Ghan SHYAM, Pravin PATIDAR, India
 - c. Exploration of a ISL configuration for MEO constellation
PVB SHILPA, Vishwanath TIRLAPUR, Ramarao G, India
- 6) QZSS

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* 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, 16 October.

1015-1100 GNSS Compatibility & Spectrum (*IDM Standards and Information Exchange*)

1) PRESENTATIONS

- a. Parametric Analysis of Receiver Output for Interference Detection

Weimin ZHEN, China

2) IDM Task Force Report

Rick HAMILTON, Weimin ZHEN

3) Update Task Force Members/Participants List

4) Review previous recommendations, actions and next steps

- a. Next IDM Workshop: Focus on aviation and IDM
b. Recommendation 14.1: Booklet on GNSS/RNSS Spectrum Protection
c. Discussion on the future recommendation on Testing Approval Public Notification

1100-1120 Coffee Break

1120-1200 GNSS Compatibility & Spectrum (*Signal Compatibility and Spectrum Protection*)

1) PRESENTATIONS

- a. European proposal regarding WRC-23 agenda item 9.2 – GNSS Interference

EU TBD

- b. ESA proposal for WRC-31 agenda item – new RNSS allocation in 5 GHz band

ESA TBD

2) Update Subgroup Members/Participants List

3) Review previous recommendations and actions

1200-1300 System-of-Systems Operation (Civil Signal Authentication)

1) PRESENTATIONS

PROVISIONAL AGENDA

- a. Measured performance results from Galileo's Open Service Navigation Message Authentication

I. FERNANDEZ HERNANDEZ, EU

- b. QZSS Navigation Message Authentication Service Status

Motohisa KISHIMOTO, Japan

- c. Update on Navigation Message Authentication (NMA) for NavIC SPS

Pravin PATIDAR & Neetha TIRMAL, India

- 2) Review actions and next steps

1300-1400 Lunch

1400-1430 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.

- 3) Review actions and next steps

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.

1430-1500 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 actions and next steps

**1500-1600 Joint Working Group Session (WG-D invited):
Interoperability & Service Standards (Multi-GNSS
Interoperability – Timing)**

- 1) Review previous discussions, actions from WG-S

Xiaochun LU, China, Tatiana PRRIMAKINA, Russia, Jerome DELPORTE, CNES

- 2) PRESENTATIONS

TBD

- 3) Update timing experts' distribution list

- 4) New, actions, recommendations, and next steps

New WG-S Draft Recommendation (for review/consideration):

GNSS providers should consider reaching out to their domestic receiver manufacturers (industry) to get feedback on multi-GNSS interoperable time. The reference list of questions and criteria should be used to guide the request for feedback. The format of the exchange of information could be in the form of an email exchange, meeting/phone call or through a workshop with industry.

Timing experts from Working Group S, in coordination with Working Groups B and D, should organize a meeting or workshop to discuss the results of the receiver manufacturer feedback.

New WG-D Draft Recommendation (for review/consideration)

1. GNSS Providers and multi-GNSS receiver manufacturers consider the benefit of using the common pivot $bUTC_{GNSS}$ contained in the GNSS navigation message to determine the GNSS inter-system time biases in addition to other existing methods (estimation at user level or use of broadcast GNSS-to-GNSS time offset). For standard ground/air users, this eliminates the need to create an ad hoc time scale as common pivot.

2. GNSS providers continue their efforts to improve the prediction of UTC broadcast in the navigation message with the help of time laboratories, with the aim to improve their time dissemination service and also the GNSS interoperability.

1600-1620 Coffee Break

**1620-1800 Joint Working Group Session (S, B, C & D invited):
Lunar PNT (led by WG-B)**

Wednesday, 18 October

**0900-0930 Joint Working Group Session (S, B, C & D invited):
Disaster Risk Reduction (led by WG-D).**

**0930-1030 Joint Working Group Session (S, B, C & D invited):
Precise Point Positioning (PPP) Interoperability**

1) PRESENTATIONS

a. Galileo HAS status

Ignacio FERNANDEZ HERNANDEZ, EU

b. QZSS PPP/PPP-RTK status

Yoko SAKAI, Japan

c. BDS PPP service status update

Nie XIN, China

d. Interoperability Analysis of Open PPP/PPP-RTK Services

Rui HIROKAWA, Japan

e. U.S. High Accuracy Service Update

Attila KOMJATHY, U.S.

f. Open-Source Real-Time PPP-AR Software

Jianghui GENG, IGS

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

Rui HIROKAWA, Japan, Simon REYNOLDS, Australia & Ignacio

FERNANDEZ-HERNANDEZ, EU

2) Update Task Force distribution list

3) Review actions and next steps

a. Third Workshop to be held in 2023

**1030-1100 Joint Working Group Session (S, B, C & D invited):
Open Service Information Sharing and Service
Performance Monitoring (International GNSS
Monitoring and Assessment)**

1) PRESENTATIONS

TBD

PROVISIONAL AGENDA

- 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

New Draft Recommendation (for review/consideration):

The Working Group on Systems Signals and Services recommends that the ICG adopt new revisions to the Terms of Reference Document for the IGMA Trial Project that were agreed to by the IGMA Task Force in August 2023.

1100-1120 Coffee Break

1120-1200 Other WG-S Topics (LEO PNT)

- 1) PRESENTATIONS

- a. LEO-PNT Demonstrator, Future System Perspectives and Possible Areas of Coordination

R. PRIETO-CERDEIRA, ESA

- b. In-orbit Testing Results of CENTISPACE LEO Augmentation Experimental Satellites

Long YANG, China

- 2) Actions, recommendations, and next steps

New Draft Recommendation (for review/consideration):

ICG members should consider inviting domestic LEO PNT system providers (non-government) to participate in the ICG and its relevant working group meetings. This participation could include requesting ICG Observer Status if interested.

To further the discussions that took place at the June 2023 LEO PNT Workshop, WG-S will organize another workshop focused on both interoperability and compatibility issues.

1200-1300 GNSS Compatibility & Spectrum Wrap-up

- 1) Summary Report of the Compatibility & Spectrum Subgroup

Dominic HAYES, EU & Takahiro MITOME, Japan

1300-1400 Lunch

Thursday, 19 October

0900-0930 Interoperability & Service Standards Wrap-up

- 1) Summary Report of the Interoperability & Service Standards Subgroup

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

0930-1015 Refinement of the WG-S Report to the Committee and Providers Forum

1015-1100 *Review and Consensus on Working Group Actions and Recommendations; Review Final WG-S Report to the Committee and Providers Forum*

- 1) Compatibility and Spectrum Actions and Recommendations

Sergey REVNIVYKH & Jeff AUERBACH

- 2) Interoperability and Service Provision Actions and Recommendations

Sergey REVNIVYKH & Jeff AUERBACH

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

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

- 5) Closing Remarks

Sergey REVNIVYKH & Jeff AUERBACH

1100-1120 Coffee Break