

ICG WORKING GROUP S
Systems, Signals, and Services
ICG-15 Meeting

Vienna, Austria
27-30 September 2021
AGENDA

Monday, 27 September

1000-1230 Subgroup Meetings

Wednesday, 29 September

0930-0945 Introduction

- 1) WG-S Co-chairs Opening Remarks
- 2) Approval of the Agenda
- 3) WG-S Events in 2021

0945-1015 GNSS System Provider Updates*

- 1) BeiDou (BDS)
- 2) Galileo
- 3) GLONASS
- 4) GPS
- 5) QZSS
- 6) IRNSS/NAVIC
 - a. Presentation: Overview of new NavIC L1 SPS Signal structure, Modulation and CEMIC Scheme

D. UPADHYAY & V. BHADOURIA, SAC/ISRO, India

* 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 Tuesday, 28 September.

AGENDA

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

1) PRESENTATIONS

- a. The method of GNSS Interference Detection in Civil Aviation

Weimin ZHEN, China

- b. Pseudolite based navigation systems for aviation applications: An update

Ashish SHUKLA, SAC/ISRO, India

2) IDM Task Force Report

Rick HAMILTON, Weimin ZHEN

3) Review Actions, Recommendations and Next Steps

1100-1120 Coffee Break

1120-1230 GNSS Compatibility & Spectrum (*Signal Compatibility and Spectrum Protection*)

1) PRESENTATIONS

- a. Protection from out of band emissions and need for Regulation in S-Band Navigation: NavIC Experience

GHANSHYAM & P. PATIDAR, URSC&SAC/ISRO, India

- b. Focus on WRC-23: Topics Relevant to GNSS

Hon Fai NG, International Telecommunication Union

2) Review previous recommendations and actions

Recommendation 14S.1: Spectrum Protection Booklet

Recommends:

1. that the WG-S Compatibility and Spectrum subgroup, in coordination with the ICG Secretariat, produce a draft booklet on GNSS/RNSS Spectrum Protection based on the briefing material used for the ongoing spectrum seminars:

- Fundamentals of GNSS
- Interference and Spectrum Management
- Interference Threats
- Methods of Interference Detection and Mitigation
- Current Interference Challenges

AGENDA

2. that the ICG consider formal endorsement of the draft booklet at a future meeting

1230-1330 Lunch

1330-1430 System-of-Systems Operation (Orbital Debris Mitigation)

1) PRESENTATIONS

- a. IGSO De-Orbit Way

Mari Yuzawa GOTO, Japan

- b. Study on Disposal Options of BDS EOL Satellites

ZHOU Jing, China

- c. IADC MEO Report

Manuel METZ, IADC

2) Discussion of IADC Report (November 2020)

David TURNER, U.S. & Sergey REVNIVYKH, Russia

3) Actions, Next Steps

1430-1500 Interoperability & Service Standards (*Open Service Standards*)

1) PRESENTATIONS

- a. Novel interleaved Z4 linear PRN codes for NavIC L1-SPS

Sugandh MISHRA & D DHARMAPA, SAC&ISTARAC/ISRO, India

- b. Navigation Messaging Service and Authentication for NavIC SPS: An Update

A. DWIVEDI & Hemraj SHAU, URSC&SAC/ISRO, India

2) Update from the Performance Standards Team

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

3) Review Actions, Next Steps

1500-1520 Coffee Break

**1520-1550 Joint Working Group Session (S, B, C & D invited):
Open Service Information Sharing and Service**

AGENDA

Performance Monitoring (International GNSS Monitoring and Assessment)

1) PRESENTATIONS

- a. Status Update of IGMA-IGS activities

Tim SPRINGER, ESA

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

Satoshi KOGURE, Shuli SONG

3) Review Actions and Next Steps

**1550-1630 Joint Working Group Session (S, B, C & D invited):
Precise Point Positioning (PPP) Interoperability**

1) PRESENTATIONS

- a. Introduction and Application of BDS PPP Service

XU Xiaojun, China

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

Rui HIROKAWA, Japan, Simon REYNOLDS, Australia & Ignacio

FERNANDEZ-HERNANDEZ, EU

3) Review Actions, Next Steps

**1630-1730 Joint Working Group Session (S, B, C & D invited):
Interoperability & Service Standards (Multi-GNSS Interoperability – Timing)**

1) Review previous discussions, actions from WG-S

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

2) PRESENTATIONS

- a. Time interoperability and the CCTF Recommendation

G. PETIT, P. DEFRAIGNE, BIPM

- b. NavIC-Galileo Time offset determination: An update

Anu AARORA, ISTRAC/ISRO, India

- c. New results of single station GNSS to GNSS time offsets and the offsets prediction

H. YUAN, NTSC, China

AGENDA

- 3) New Considerations, actions, next steps

1730-1800 Joint Working Group Session (S, B, C & D invited): Geodetic References

- 1) Discussion led/organized by WG-D

Thursday, 30 September

Interoperability (Receiver)

0900-0930

- 1) PRESENTATIONS

- a. Configurable NavIC Payload Signal Integrity & Coherency Test Receiver

Rakesh BIJARNIYA, SAC/ISRO, India

- b. Novel Modulation, Coding and Soft decoding algorithms for NavIC L1
Receivers

Deepak MISHRA, SAC/ISRO, India

0930-1000 GNSS Compatibility & Spectrum

- 1) Report of the Compatibility & Spectrum Sub-Group

Dominic HAYES, EU & Takahiro MITOME, Japan

- 2) Review Recommendations, actions and next steps

1000-1030 Interoperability & Service Standards

- 1) Report of the Subgroup Co-chairs

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

- 2) Review recommendations, actions and other discussion items

1030-1100 Refinement of the WG-S Report to the Committee and Providers Forum

AGENDA

1100-1120 Coffee Break

1120-1230 *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

Takahiro MITOME, Dominic HAYES, Sergey REVNIVYKH & David TURNER

2) Interoperability and Service Provision Actions and Recommendations

Xiaochun LU, Jeff AUERBACH, Sergey REVNIVYKH & David TURNER

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

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

5) Closing Remarks

David TURNER, U.S. & Sergey REVNIVYKH, Russia

1230-1330 Lunch