Tuesday, 10 December

0900-0915  Introduction
1) WG-S Co-chairs Opening Remarks
2) Approval of the Agenda
3) WG-S Events in 2019

0915-1000  GNSS System Provider Updates*
1) BeiDou (BDS)
2) Galileo
3) GLONASS
4) GPS
5) QZSS
6) IRNSS/NAVIC
   a. NavIC performance using S-band signals  
      V.M. TIRLAPUR, India
   b. NavIC Availability, Performance and Advantages  
      Anindya BOSE, 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 Monday, 09 December.

1000-1100  GNSS Compatibility & Spectrum (*IDM Standards and Information Exchange*)
1) PRESENTATIONS
a. BDS Status Information Service
   
   Changjiang GENG, China
b. GNSS interference detection and localization in city and civil aviation
   
   Weimin ZHEN, China
c. New steps in the navigation conditions monitoring project
   
   Sergey SILIN, Russia

2) IDM Task Force Report

   Rick HAMILTON, Weimin ZHEN

3) Review actions and next steps

1100-1120   Coffee Break

1120-1300   GNSS Compatibility & Spectrum (Signal Compatibility and Spectrum Protection)

1) PRESENTATIONS

   a. Compatibility experiment of BeiDou RDSS and 5G
      
      WenJun ZHAO, China

   b. Message Authentication for Legacy GNSS Systems
      
      Durga DIGADARSINI, India

   c. Progress report regarding development of new Recommendation for protection GNSS spectrum
      
      Dmitry ARONOV, Russia

   d. ITU Report on WRC-19 Outcomes
      
      Hon Fai NG, ITU

   e. RNSS related discussion at WRC-19, including results from WRC-19 and WRC-23 agenda items
      
      Dominic HAYES, EU & Takahiro MITOME, Japan

1300-1400   Lunch

1400-1500   System-of-Systems Operation (Orbital Debris Mitigation)

1) PRESENTATIONS
a. Disposal strategy of BDS Satellites Based on Long-term Collision Probability
   Jing ZHOU, China

2) Status of Recommendation 13S.2: IADC study
   David TURNER, U.S. & Sergey REVNIYKH, Russia

1500-1600 Interoperability & Service Standards (Open Service Standards)

1) PRESENTATIONS
   a. Status of «Interoperability-2030» Project
      Sergey Silin, Russia
   2) Update from the Performance Standards Team
      Sergey KAPLEV, Russia & John LAVRAKAS, U.S.
   3) Review Actions

1600-1620 Coffee Break

1600-1630 Joint Working Group Session (S, D invited): Open Service Information Sharing and Service Performance Monitoring (International GNSS Monitoring and Assessment)

1) APSCO-IGMA Project Update
   Manop Aorpimai, APSCO
   2) Report of the IGMA Task Force
      Satoshi KOGURE, Shuli SONG
   3) Review Actions and Next Steps

1630-1800 Joint Working Group Session (S, D invited):
Interoperability & Service Standards (Multi-GNSS Interoperability – Timing)

1) PRESENTATIONS
   a. IGS Timing Activities and WG on Clock Parameters
      Allison Craddock, IGS
   b. Time Transfer by GNSS
PROVISIONAL AGENDA

Tatiana PRIMAKINA, Russia

c. Use of current broadcast time-offsets for multi-constellation users in harsh environments

   F. MELMAN, X. OTERO, P. CROSTA, R. LUCAS, ESA

d. Comparative Study on different GNSS Time Offsets Monitoring Methods

   Haibo YUAN, China

e. Use of UTC to Support GNSS Interoperability

   P. Tavella, BIPM

f. Use of GGTO

   P. Tavella, BIPM

g. The Problems of GNSS Time Monitoring

   JSC Russian Institute of Radionavigation and Time

2) Discuss outcomes and actions from 2019 WG-S Intersessional Meeting and Timing Workshop

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

3) Review Actions and Next Steps

Wednesday, 11 December

0900-1100   Joint Working Group Session (S, B, C, D invited):
             PPP Interoperability

1) PPP Interoperability
   a. Discuss outcomes and conclusions from June 2019 PPP Workshop

      Suelynn Choy, Daniel Blonski, Workshop Co-Chairs

   b. PRESENTATIONS
      i. Precise Point Positioning with Standalone NavIC

         R. BABU, India

      ii. High-end GNSS receivers capable of IRNSS L5/S-band signal tracking
           for RTK/PPP positioning services
PROVISIONAL AGENDA

Alexei ZINOVIEV, Ukraine

c. Review draft recommendation

2) Other Joint Working Group Topics for Discussion

a. PRESENTATION: Recent Developments and Efforts Undertaken by the UN GGIM Subcommittee on Geodesy in Support of Geodetic Capacity Building

WG-D Co-chairs

1100-1120  Coffee Break

1120-1210  GNSS Compatibility & Spectrum

1) Report of the Compatibility & Spectrum Sub-Group

Dominic HAYES, EU & Takahiro MITOME, Japan

2) Review Recommendations, actions and next steps

Draft 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]

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

1210-1300  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

a. Proposal for an IGMA and Performance Standards Workshop in 2019

b. Draft Recommendation 14S.2: PPP Interoperability Task Force

The ICG should establish a Task Force within the WG-S Interoperability Subgroup, with participation from WG’s B and D. The Task Force will draft a
work plan focused on the objective of improving the interoperability of Precise Point Positioning (PPP) services

Specifically, the Task Force will:

- Consider involving/discussing with the SBAS Interoperability Working Group and the ICAO Navigation Systems Panel moving forward
- Concentrate on establishing the foundational documents, and baseline language to develop a common language on the basic parameters, etc. – WG-D Proposal: Publish and disseminate PPP signal and system information
- Seek answers from Service Providers (governmental and commercial) to the questions formulated at the 1st PPP Workshop and follow-on issues identified by the Task Force

1300-1400  Lunch

1300  Technical Tour

Thursday, 12 December

0900-1100  Review and Consensus on Working Group Actions and Recommendations; Refinement of the 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

1100-1130  Coffee Break