International Committee on Global Navigation Satellite Systems

Working Groups D, B, and S

"Standards and Interoperability of Precise Point Positioning Services"

ICG-14

Outline

1. ICG-13 discussion on PPP, November 2018
2. Special Technical Session on PPP @ UN ICG Workshop on the Applications of GNSS, Suva Fiji, 24-28 June 2019
3. WG-S Intersessional Meeting - JRC Ispra 5-7 September 2019
4. Next steps

GNSS System Provided PPP Services

International Committee on Global Navigation Satellite Systems

India and Africa as well!

System	SV Orbit	Augmentation Signal for PPP	Frequency (MHz)	Bandwidth (bps)
Galileo	MEO	E6B	1278.75	500
GLONASS/SDCM	GEO	L3CBO	1202.025	4000
BeiDou-3	GEO	B2B	1207.14	1000
QZSS	IGSO and GEO	L6D, L6E	1278.75	2000
Australia	GEO			
Korea	IGSO and GEO	L6	1278.75	

GNSS System Provided PPP Services

India and Africa as well!

System	Coverage	Format	Supported GNSS/RNSS	Service
Galileo	Global Regional	Open (CSSR)		PPP (global) SSR-RTK (regional)
GLONASS/ SDCM	Regional		GPS, GLO, GAL, BDS	
BeiDou-3	Regional	Open		
QZSS	Regional	Open (CSSR)	GPS, QZSS, GLO & GAL	PPP, PPP-AR SSR-RTK (JAP)
Australia	Regional	Open	GPS & GAL	PPP
Korea	Regional			

GNSS PPP Signal and System Information

System	Interface Specification Document	Service Level Information/Definition	PPP Performance Standard
Galileo	✓		
GLONASS/SDCM			
BeiDou-3			
QZSS	✓	✓	✓
Australia			
Korea			

ICG-13 Discussion

- WG-D held a joint meeting with WGs B and S to discuss “Interoperability of GNSS Precise Point Positioning (PPP) Services”.
- It was agreed that it was too early to decide whether this should become a new work item of the ICG. However there was consensus that the topic is worthy of further exploration and that all 3 working groups should be involved.
- It was agreed that a useful way forward is to hold a dedicated workshop on PPP Services during the first half of 2019.

(1st) Special Technical Session on PPP

- A special technical session on “Standards and interoperability of precise point positioning services” was organized and moderated by the representatives of the ICG working groups S, B and D @ UN ICG Workshop on the Applications of GNSS, Suva Fiji, 24-28 June 2019.
- The purpose of the session was to increase awareness of the systems-provided precise point positioning (PPP) services, the user benefits and opportunities to support positioning , time and navigation (PNT) applications in developing countries; and to encourage standardization and interoperability of the system provided PPP services.
- The meeting was conducted in two sessions: one public PPP session as part of the UN ICG/ Fiji Workshop on Applications of GNSS; and one closed session for ICG members.


Workshop on the Applications of
Global Navigation Satellite Systems
24 - 28 June 2019
Suva, Fiji
Pacific Community
Communauté du Pacifique
PGSC
HEXAGON
Leica
Geosystems
RESERVED

- **During the open session**, the plans for providing PPP services from several providers have been presented:
  - **RUS** presented about the intended High Precision Service with a terrestrial test as of 2020 for limited users and a full service covering Russia as of 2030. This High Precision Service will be broadcast by GLONASS/SDCM on L3 signal.
  - **JPN** presented about QZSS CLAS and QZSS PPP services to be broadcasted on L6 signal. JPN also presented an update on the Compact SSR format.
  - **EU** presented on status of the Galileo System and the plans for the Galileo High Accuracy Service with an initial HAS capability as of 2020/21. The Galileo HAS will be a global service enabling PPP and it will be free to Galileo users.
  - **CHN** provided a description of the BDS system and some high level insights on the BDS PPP service. In addition the presentation was mainly addressing the application of the PPP technique for time transfer.
  - **AUS** presented on the results on the Australian SBAS PPP testbed activities and provided an outlook for the future PPP service.
  - Natural Resources Canada (NRCan) presented on the **IGS WG on PPP-AR** and the ongoing activities to develop a combined IGS products using contributions from various analysis centre to allow users to perform PPP-AR.
  - **WG-D** provided an introduction to PPP and identified a set of key-points for interoperability of PPP services. Furthermore, a draft recommendation for ICG-14 has been presented.
  - All presentations, highlighted the importance of harmonization of key-aspects of PPP services.
- The public presentations are available here: http://www.unoosa.org/oosa/en/ourwork/psa/schedule/2019/2019-un-fiji-workshop-on-the-applications-of-gnss.html

- **Closed session.** The meeting attendees included representatives from Australia, China, Japan, EU, Russian Federation, USA, FIG and IGS.
- Meeting minutes were circulated to meeting participants.
- Consolidated Actions:
  - **Action #1** – consider involving/discussing with the SBAS Interoperability Working Group and the ICAO Navigation Systems Panel moving forward. **[To do]**
  - **Action #2** – concentrate on establishing the foundational documents, and baseline language to develop a common language on the basic parameters, etc. as noted in Item 3 - Publish and disseminate PPP signal and system information. **[To do]**
  - **Action #3** – consider discussing a task force within the interoperability subgroup. **[Completed]**
  - **Action #4** – WG-S will attempt to make progress on formulating a draft recommendation for discussion and approval at their intersessional meeting in September 2019. **[Completed]**
  - **Action #5** – in preparation for the WG-S intersessional, the group will develop questions to stimulate discussion in WG-S intersessional meeting in September and also to highlight the importance to develop such foundational documents to PPP services. It is also recommended that Providers should consider the questions and prepare a response for the WG-S intersessional meeting. **[Completed]**

WG-S Intersessional Meeting

- WG-S Intersessional Meeting took place at JRC Ispra, 5-7 September 2019.
- WG-S reviewed the questions/outcomes from the June Workshop which led to a draft recommendation to form a PPP Task Force under WG-S.

DRAFT ICG-14 Recommendation 14S-2

- The ICG should establish a Task Force within the WG-S Interoperability Subgroup, with participation from WGs 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

Discussion

- Next steps ?
  - Review draft recommendation 14S-2
  - Chairs of the PPP Task Force
  - 2nd PPP workshop in 2020 to discuss and formulate work plan

- **Response to Action #5.** Questions for Providers to consider:

1. During the Joint WG-S/-B/-D workshop in Fiji, the participating experts recognised the importance of “Interoperability of Precise Point Positioning (PPP) Services”. Is this finding shared and therefore worthy of further discussion and cooperation within the ICG? (Yes/ No)

2. If “Yes”, how can this be achieved? Is the current multi-WG team of experts under the umbrella of the Interoperability Sub-group of WG-S a suitable setup? (Yes/ No)

3. Should in the ICG WG’s (S/B/D) experts work towards a roadmap detailing the activities aimed at interoperability and compatibility of PPP service providers?

4. Should foundational documents be identified as part of the activities (i.e. templates containing information about the PPP services)?

5. Should a baseline language, e.g., basic set of parameters (ie unified terms and definitions) and methods of calculation and monitoring, be developed be developed for sharing of PPP service information?