Global Positioning Systems (GPS)
2021 Public Interface Control Working Group (ICWG) Meeting Minutes

Meeting Date: 29 September 2021
Meeting Times: 0830 – 1530 Hrs. (Pacific Time)
Location: Virtual
Dial In: 571-200-1700
Meeting ID: 160 913 1495
Password: 813441
Zoom Meeting Link:

https://saicwebconferencing.zoomgov.com/j/1609131495?pwd=WTNkK01ES0pCc2NqR1VJdjhkd3NEQT09

Government POC: Lt. Adam Barnette
SE&I RE and POC: Ralph E. Anthony
SE&I SMEs: Albert Hayden
SE&I Facilitator: Kevin Cano

Meeting Started   0830 Hrs. (Pacific Time)
Meeting Ended   1530 Hrs. (Pacific Time)

Agenda:

Part 1 (Public ICWG): 0830 – 12450 HRS (Pacific Time)
- Roll Call
- Agenda Overview
- Opening Remarks
- Rules of Engagement & Meeting Purpose
- GPS Technical Baseline Change Management Process
- RFC-467: 2021 Public Document Proposed Changes
- Open RFC Discussion Session
- Action Item Review (Past Years, 2021)

Part 2 Public Forum: 1300 – 1430 HRS (Pacific Time)
- Special Topic Presentations
    - CNAV/CNAV2 Message Schedule
    - Broadcast Interval Working Group
    - CNAV/CNAV2 ISM Parameter
    - Issue of Data Clock (IODC)
    - AEP vs OCX Almanac time of almanac (TOA) Behavior
    - GPS Non-Standard Codes
    - Next Generation GPS – OCX Public Release Data Products
- Walk-on Topics, Open Discussion
- Action Item Review and Closing Remarks

Last Name	First Name	Organization	Present
Abduselam	Hamza	Federal Aviation Administration (FAA)	X
Alton	Jim	GPS Systems Engineering and Integration (SE&I)	X
Anderson	Nathan	Department of Transportation (DOT)	X
Anthony	Tony	GPS Systems Engineering and Integration (SE&I)	X
Barnette (Lt)	Adam	US Space Force, Space Systems Command	X
Beekhuysen	Nilanthi	Leidos	X
Bisio	Jolita	GPS Systems Engineering and Integration (SE&I)	X
Bolger	Jason	GPS Systems Engineering and Integration (SE&I)	X
Bouvet	Denis	Thales Group	X
Brown	Steven	Lockheed Martin Corporation	X
Burns	Jason	Federal Aviation Administration (FAA)	X
Campbell	John	Aerospace Corporation	X
Cano	Kevin	GPS Systems Engineering and Integration (SE&I)	X
Chiu	Robert	Aerospace Corporation	X
Clair	Rex	Lockheed Martin Corporation	X
Crisafulli	Frank	US Coast Guard	X
Crum	Jeff	Infinity Systems (Lockheed Martin)	X
DeGuzman	Erick	GPS Systems Engineering and Integration (SE&I)	X
Dennis	Jed	Federal Aviation Administration (FAA)	X
Ding	Yi	CMC Electronics	X
Dougherty	Jamie	Tetra Tech Consulting (FAA)	X
Fernow	James	MITRE	X
Foley	John	Garmin	X
Guay	Francois	Quantum Avionics	X
Hansen	Andrew	Volpe National Transportation Systems Center (DOT)	X
Hayden	Bert	GPS Systems Engineering and Integration (SE&I)	X
Hilario	Ramon	US Navy (SSC/PCV)	X
Hillman	Stephan	Aerospace Corporation	X
Hutsell	Steven	US Space Force, 2nd Space Operations Squadron	X
Johnson	Nathan	GPS Systems Engineering and Integration (SE&I)	X
Kalyanaraman	Sai	BAE Systems	X
Kirpes	Roger	BAE Systems	X
Knag	Leif	Raytheon	X
Kovach	Karl	Aerospace Corporation	X
Lake	James	Canyon Consulting	X
Latterman	Don	GPS Systems Engineering and Integration (SE&I)	X
Lin	Victor	Aerospace Corporation	X
Mabilleau	Mikael	European GNSS Agency	X
Maenpa	Jon	Raytheon	X
McCanless	John	Booz Allen Hamilton	X
Meyers (Maj)	Samuel	US Space Force, Space Systems Command	X

Last Name	First Name	Organization	Present
Miller	Allison	Sandia National Laboratories	X
Montgomery	Walter	GPS Systems Engineering and Integration (SE&I)	X
Morrison	Nancy	Lockheed Martin Corporation	X
Mroz	Urmie	Raytheon	X
Naick	Purvis	Federal Aviation Administration (FAA)	X
Neal	Pam	Aerospace Corporation	X
Nguyen	Ha	Federal Aviation Administration (FAA)	X
Nguyen	Tan	Space Force (SSC/PCV)	X
Nicholas	Dylan	GPS Systems Engineering and Integration (SE&I)	X
O'Brien	Edith	GPS Systems Engineering and Integration (SE&I)	X
Quan	Vince	GPS Systems Engineering and Integration (SE&I)	X
Semler	Jim	L3 Harris Technologies	X
Sherman	Jason	Lockheed Martin Corporation	X
Shook	Garret	US Navy / National Geospatial-Intelligence Agency (SSC/PCN)	X
Skalski	Hank	US Space Force (SPOC)	X
Slattery	Rhonda	Aerospace Corporation	X
Stevens	Jeff	MITRE	X
Su	Wayne	GPS Systems Engineering and Integration (SE&I)	X
Tinnon	Shon	GPS Systems Engineering and Integration (SE&I)	X
Urbanska	Katarzyna	European Space Agency	X
Van Roekel	Robert	US Space Force, Space Systems Command	X
Yakura	Justin	L3 Harris Technologies	X

Zoom Dial-In Attendees:

Last Name	First Name	Organization	Call In Number
Ding	Yi	CMC Electronics	U186858 (Caller ID)
Mroz	Urmie	Raytheon	303-903-4639
Maenpa	Jon	Raytheon	310-739-2332
Hutsell	Steven	USSF/2SOPS	719-567-2491
Crisafulli	Frank	USCG	772-215-3237

Opening Remarks (Briefer: Major Samuel Meyer, Chief, Positioning, Navigation and Timing Integration):

"Good morning, good afternoon or good evening depending on your time zone, it is truly an honor to be with you today and speak on behalf of the United States Space Force's Space Systems Command. Lt. Adam Barnette, thank you for the introduction and giving me this opportunity to provide an update on some activities and development efforts happening across the GPS enterprise, and thank you to the other briefers and the event organizers for making this event happen today so we can continue this discussion online and across the globe. It is truly an honor to be a part of this team and share time with such esteemed members of the global Public PNT (Position, Navigation, and Timing) community. My opportunity today is to give you the program office perspective of the GPS, and there is a lot to talk about because we are significantly modernizing all segments of the GPS enterprise…"

NSCA has Special Properties

Denis Bouvet: When a fault is detected, do we still have some valid signals on the entire Doppler transient of Non-Standard Code/A (NSCA)?

Karl Kovach: When a fault is detected, every signal is affected.

Action item: none

RFC-467 Proposed Changes to the Public Documents (Briefer: Mr. Tony Anthony, SAIC)

Mr. Tony Anthony introduces himself and the topics he will be covering, RFC-467's background and comment overview.

Mr. Tony Anthony names the main POC's (Point of Contact) who worked RFC-467 as, Dr. Andrew Hansen (Department of Transportation), Mr. Karl Kovach (Aerospace Corporation), Mr. Tony Anthony, and Mr. Albert Hayden (SAIC). He also points out the link shown on slide 18 should be used to access the PCN's (Proposed Change Notice) and CRM (Conflict Resolution Matrix) as they will be routinely referenced throughout this presentation.

Mr. Tony Anthony gives an overview of RFC-467, stating the status of obtaining navigation integrity for GPS; GNSS (Global Navigation Satellite System) receivers must manually extract integrity information from performance standards and encode it into their receivers, which can have two negative effects. First, receivers cannot automatically update their integrity solution when the information changes and second, receivers rely on foreign entities documentation for GNSS integrity solutions. We can ameliorate these two negative consequences by introducing a new CNAV/CNAV-2 (Civil Navigation) message just for integrity navigation in IS200 (Interface Specification), IS705, and IS800.

Problem Statement (Slide 27): Mr. Tony Anthony describes the problem statement, and then continues onto the next slide.

RFC-467 Comments Resolution Matrix (CRM) Status (Slide 28): Mr. Tony Anthony shows the total number of comments on slide 28 within their respective categories of critical, substantive and administrative. He mentions administrative comments that where accepted/accepted with comments will not be covered, however all critical, substantive, and rejected admin comments will be covered.

Open RFC Discussion

Mr. Tony Anthony express the results of all comments in the Post-Public-ICWG PowerPoint Slide Deck. All actions that came out of the RFC-467 presentation are expressed as redlines or extra annotations in the PowerPoint.

Past Public ICWG Action Item Review

<u>2014:</u>

• PRAT Item 26: -In Progress. PRN expansion still in internal development. SE&I to review for current status with Mr. Karl Kovach and update the PRAT accordingly.

<u>2015:</u>

• PRAT Item 1: -In Progress. Topic has been on-hold; will be included in the 2022 Public ICWG RFC.

<u>2018:</u>

• PRAT Item 1: -In Progress. Government plans to work XML changes or products in new RFC "2021 Public Document Proposed Changes". Scope was removed from RFC-395.
• PRAT Item 3: -In Progress. Originator agreed to close. Recommend closure at 2020 Public ICWG. Status changed to Closed.
• PRAT Item 4: -In Progress. RFC-395 CCB approved. One of the rate equations needed to be adjusted. Adjusted in RFC-442. Status changed to Closed. RFC-442 CCB approved on 03/15/2021.
• PRAT Item 5: -In Progress. Government, along with the originator's concurrence, decided not to pursue the changes. Recommend closure at 2020 Public ICWG. Status changed to Closed.
• PRAT Item 7: -In Progress. FAA still wishes to keep the midi-almanac required until further notice. Address in Special Messaging topic this year
• PRAT Item 8: -In Progress. RFC-395 has been CCB approved. Recommend closure at 2020 Public ICWG. Status changed to Closed.
• PRAT Item 9: -In Progress. Action item part of RFC-413. Status changed to Closed. RFC-413 CCB approved on 03/15/2021.

<u>2019:</u>

• PRAT Item 4: -In Progress. The government has assessed the work and decided not to pursue the admin changes. All attempts were made to get concurrence from originator. Recommend closure at the 2020 Public ICWG. Status changed to Closed.
• PRAT Item 5: -In Progress. Action Item included in RFC-442. Status changed to Closed. RFC-442 CCB approved on 03/15/2021.
• PRAT Item 6: -In Progress. Action Item included in RFC-442. Status changed to Closed. RFC-442 CCB approved on 03/15/2021.

<u>2020 (From 30 Sep 2020 Public ICWG)</u>

• PRAT Item 1: -In Progress. RFC-442 deferred comment #4 about the GPS SV Configuration code '101'. This was address this year in RFC 467. Status changed to Closed.
• PRAT Item 2: -In Progress. Missed Action Item from 2019 Public ICWG from Mr. Denis Bouvet. IS200 Section 6.4.6.2.1 does not match current safety-of-life equipment implementation. This was address this year in Mr. Karl Kovach's Special Topic. Status changed to Closed.
• PRAT Item 3: -In Progress. Make documents consistent between using the notation "x10-1" and "1E-1". Choose one option and make all other occasions consistent.
• PRAT Item 4: Index of Data Clock (IODC) – 7 day repeat rule (RFC 467)
  Mr. Anthony confirmed that RFC-467 has replaced all occurrences in all interface documents of the IODC 7-day non-repeat rule with a 6-hour non-repeat rule.

<div align="center">** End of Part 1. Part 2 began at 1100**</div>

Public Forum

Mr. Kevin Cano introduces the second portion of this meeting beginning with the public forum and revisiting the rules of engagement.

Mr. Kevin Cano then introduced the Special Topics portion of the meeting starting with the special topic presentation by Mr. Bert Hayden.

Special Topic: CNAV/CNAV-2 Message Schedule (Bert Hayden, Science Applications International Corporation)

Mr. Bert Hayden presents his special topic discussion as is.
Mr. Bert Hayden asks for any questions or comments to which there was a brief discussion regarding the working group.

Special Topic: CNAV/CNAV-2 ISM Parameter (Dr. Andrew Hansen, Volpe National Transportation Systems Center (DOT))

Dr. Andrew Hansen presents his special topic discussion as is.
Dr. Andrew Hansen asks for any questions or comments to which there was a brief discussion regarding the utilization of the CNAV/CNAV2 ISM parameters.

Special Topic: Issue of Data (Clock) – IODC (Major Samuel Meyer, Chief, Positioning, Navigation and Timing Integration, United States Space Force (USSF)/Space Systems Command (SSC))

Major Samuel Meyer presents his special topic discussion as is.
   a. AEP vs OCX Time of Almanac (t_{oa}); (Raytheon/Harris)
   b. GPS Non-Standard Codes; Key to an approach to Integrity; (Karl Kovich)
   c. OCX Public release of Public ICWG Products (Karl Kovich); Stephan Hillman took an action?
      i. NSCA is not a Gold Code, repeats every 2 months
      ii. National Information Exchange model (NIEM)
      iii. ICD-870 (RFC for next year)
      iv. OCX-Era Product (High Level Ontology)
      v. Validate and Transfer Utility (VATU) Transform files – XML products into AEP-era ASCII text format; Shows what you saw in old ASCII codes now in HTML
   d. Discussions and Back up charts

Special Topic: GPS Non-Standard Codes (Briefer: Mr. Karl Kovach, Aerospace Corporation)

Mr. Karl Kovach presents his special topic discussion as is.
Mr. Karl Kovach asks for any questions or comments to which there is none.

Closing Remarks (Briefer: Mr. Kevin Cano, Positioning, Navigation and Timing Integration 2021 Public ICWG)

Mr. Kevin Cano closed the 2021 Public ICWG and Forum with Mr. Dylan Nicholas providing the summary of post Public ICWG actions and thanking everyone for their participation.

2021 Public ICWG Action Item Review

Year	Action Item #	Status	Originator	Description	Notes
2021	01	New	Mr. John Foley (Garmin)	Default Navigation data within sub frame 4 and 5	Mr. Hamza Abduselam (FAA) accepted an action item to determine how often default navigation data in subframes 4 and 5 has occurred in recent history, and to estimate how likely it may occur in the future.
2021	02	New	Mr. Albert H. Hayden (SE&I)	Create a concern to investigate info on Table 200-2078 for RFC 467	Mr. Albert H. Hayden (SE&I) accepted an action to investigate the information on Table 200-2078 for RFC 467.
2021	03	New	Mr. Karl Kovach (Aerospace Corporation)	Create a concern regarding the removal of Inter Signal Corrections from the Core CEI Data in the public documents.	Mr. Albert H. Hayden (SE&I) accepted an action to create a concern regarding the removal of Inter Signal Corrections from the Core CEI Data in the public documents.
2021	04	New	Dr. Andrew Hansen (DOT)	Create a concern regarding the use of Pconst instead of Rconst and MFDconst in the CNAV and CNAV2 Integrity Support Messages	Mr. Albert H. Hayden (SE&I) accepted an action to write a concern regarding the use of Pconst instead of Rconst and MFDconst in the CNAV and CNAV2 Integrity Support Messages
2021	05	New	Mr. Denis Bouvet (Thales Group)	Create a Concern for the Data ID Issue	Mr. Albert H. Hayden (SE&I) accepted an action to write a concern regarding the backward compatibility of transmitting a Data ID other than 2.

What do we want to do next year?
Minutes; Lessons Learned; Deferred Items; Write concerns (Planned RFCs); anything from the walk-on topics?
PICWG Hot Wash – use PICWG Tag up meeting time – Thursday AM 0900 (If we don't have to go into Thursday to finish)
In the Hot Wash (which was conducted on September 29th), one of the Lessons Learned stated by Mr. Tony Anthony is that the Public-ICWG materials need to be distributed to the meeting invitees well before the Public ICWG meeting day. Our standard is two (2) full business days before any meeting.

This was followed by the comment that Public Affairs needs to be reminded more consistently that the package needs to be approved in time for that distribution to stakeholders.

PA has approved Main Body Topics – ready to go