



# GPS Innovation Alliance

Misuse of Int'l Standards Processes  
To Impose Spectrum Use Requirements  
On GPS/GNSS Receivers As “Resilience”

GPS Innovation Alliance (GPSIA) presentation  
to the  
20th PNT FACA Meeting  
Redondo Beach, CA  
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# Spectrum Use Decisions Belong In Spectrum Management Fora

- RNSS frequency band use: restricted to maintain stringent accuracy, availability, integrity, and continuity parameters to **meet service provider and end user performance requirements**.
- Careful consideration made of U.S. and international regulatory environments in terms of spectrum allocations and management.
- Broadcast PNT systems cause U.S. regulators to go beyond domestic boundaries to coordinate with other nations in fora, e.g., ITU. -- where WRC final resolutions hold treaty status; *spectrum allocations stay relatively consistent worldwide*.
  - Ensures end users similar RF environments for PNT equipment independent of where they operate.
  - Non-interference with RNSS spectrum is crucial; domestic and international PNT services depend on uninterrupted broadcast, reception, and processing of radio frequencies in protected radio bands.

Federal Radionavigation Plan (FRP) 2017: “Radiofrequency Spectrum Considerations”

## Why Vigilant Monitoring of Int'l Standards Processes Matters

- The 2004 EU-US Joint “Agreement on the Promotion, Provision and Use of Galileo and GPS Satellite-based Navigation Systems and Related Applications” *is signed by twenty-five (25) EU Member States;*

- **Article 5:** Standards, Certification, Regulatory Measures, and Mandates

“The Parties agree to consult with each other before the establishment of any measures:

(1) establishing, directly or indirectly (such as through a regional organization), design or performance standards, certification requirements applicable to civil satellite-based navigation and timing signals or services, augmentations, value-added services, global navigation and timing equipment, civil satellite-based navigation and timing or service providers, or value-added service providers; or

(2) That have the effect, directly or indirectly, of mandating the use of any civil satellite-based navigation and timing signals or service, value-added service, augmentation or global navigation and timing equipment within its respective territory (**unless the mandating of such use is expressly authorized by ICAO or IMO.**)

## Broadcast Radionavigation (GPS) Is Unlike Radiocommunication Stable Spectrum Environment Enables User-driven GNSS Innovation

- Radiocommunication: two-way; system design coordinates **both** transmission and receiving equipment
- Radionavigation (GNSS): one-way broadcast is fixed for long-term life cycle of each constellation, ***independent*** of receiving equipment
  - **GNSS signals are authorized/governed by multilateral int'l agreements, including those endorsed by ITU member states.**
- GNSS Interface Control Document (ICD):
  - Specifies stable signal in space; power on ground
  - Receiver manufacturers design to a stable ICD
- GNSS receiver characteristics and interference protection criteria (IPC) are
  - **Developed in an int'l forum (ITU-R; ITU) endorsed by ITU member states.**

GPS/GNSS has shown that rapid ***user-driven changes*** (improvements) in signal processing significantly benefit performance without changing transmissions. Misuse of int'l standards to impose spectrum use requirements could harm this successful GNSS paradigm.

## GPS/GNSS Receivers Conform To *Established* Spectrum Allocations and Interference Environment

GPS/GNSS receivers, effectively and efficiently use RNSS spectrum to avoid harmful interference. This spectrum use conforms to:

- ITU Int'l Radio Regulations spectrum allocations and established interference environment
- ITU-Radio Sector Recommendations established technical characteristics and interference protection criteria (IPC) for RNSS receivers (e.g., ITU-R M.1902/3/, etc.)

***Careful consideration of electromagnetic compatibility analysis, must be made in U.S. and international regulatory environments in terms of spectrum allocations and management.***

## IEC TC 80

### Maritime Navigation And Radiocommunication Equipment And Systems

- At a recent IEC TC 80 meeting, addressing IMO Resolution MSC.401(95) participants adopted a European proposal to rename a draft standard from “Multi-GNSS” to “Multi-PNT” receivers
  - A European proposal on “PNT Guidelines” was also adopted.
- Subsequent to this meeting, GPSIA joined the American National Standards Institute (ANSI), representing the US Admin to IEC TC 80
  - To ensure that any spectrum use, non-conforming to ITU Int’l Radio Regulations is not proposed in this forum as “PNT resilience” (spectrum use) requirements on GPS/GNSS receivers.
- Multi-PNT receivers and PNT Guidelines should conform to
  - ITU Int’l Radio Regulations spectrum allocations and interference environment
  - ITU-Radio Sector Recommendations technical characteristics and interference protection criteria (IPC) for RNSS receivers (e.g., ITU-R M.1902/3/, etc.)