

Working Group 1: Assured Availability
-- Protect The Clear and Truthful Reception of Radionavigation Signals

1.1 Spectrum Allocation Assurance
(Spectrum Sub-working Group)

Commercial Pseudolite Operations in the RNSS Bands –Recap and Status
December 10, 2014

Recap: CEPT ECC Recommendation 11(08)

- Would exclude GNSS availability and existing GNSS indoor uses in the band at 1559-1610 MHz by allowing commercial operations of “GNSS CW and pulsed PL . . . that may have the potential to cause”:
 - “[*P*]artial or total degradation of the accuracy of other position location devices, in particular, of non-participating receivers;
 - “[*I*]nterference to GNSS receivers in airport areas, or in the vicinity of them.”
 - “Therefore, this kind of non participative GNSS receiver cannot be protected”. (See ECC Report 168 providing the regulatory framework for indoor commercial PL operations at 1559-1610 MHz.)
- Status: *ECC Recommendation 11(08) has been approved by ECC and is circulating for adoption among CEPT Administrations.*

Recap: ETSI Commercial GNSS PL Standard For Indoor and Outdoor Operations In The 1559-1610 MHz Band

- An ETSI commercial in-band PL standard is under development for eventual harmonized adoption in CEPT countries:
 - To address commercial markets, including mines, ports, construction, agriculture and other outdoor applications;
 - The ETSI standard would follow guidance on an authorization regime, e.g.:
 - “It should be considered to establish no-fly zones on the corresponding aeronautical charts to ensure that pilots are aware of the potential impact on their navigation systems;”
 - “Due to the potential threat posed by malfunctioning equipment, it should be the duty of the licence holder to monitor the correct functioning of the equipment and terminate transmission immediately if malfunctions occur (supervisory function);”
 - “PRN codes dedicated to PLs are provided by the respective RNSS system operator and should be locally administered by national authority. . . They shall be specified as part of any licence.”

(Partial list of guidances – see ECC Report 183, Regulatory Framework for Outdoor PL Operations at 1559-1610 MHz band):

Status: International GNSS Community Dialogue Has Been Cooperative With Some Progress

- The international GNSS user equipment industry has been participating in constructive discussions with GNSS providers and regulators in the U.S., Europe, Japan, and including international GNSS PL industry counterparts:
 - To discuss the technical, regulatory, and market implications of operating commercial PL networks in the 1559-1610 MHz band:
 - Such use would contravene the ITU International Table of Frequency Allocations and could disrupt seamless worldwide GNSS availability and user operations:
 - To share technical and commercial market experience in operating commercial PL networks:
 - Multiple international providers broadcast their commercial PL ranging signals outside of the RNSS band to avoid interference to user operations:
 - “A current trend in PL development serves to address these complications by moving off of L1 frequency and using more robust signal structures. (See Knali, “Limitations of Pseudolite Systems Using Off-The-Shelf GPS Receivers”, 2004.)
- It is our understanding that several European PL providers that originally planned on in-band commercial operations will now be operating outside of the RNSS bands.

Actions For PNT AB Consideration

To recommend to the Ex-Com that the US and EC seek to work cooperatively with CEPT to:

1. *Seek withdrawal or amendment* of CEPT ECC Recommendation 11(08), “Framework for Authorisation Regime for Indoor GNSS PL in 1559-1610 MHz”:
 - Pursuant to published CEPT ECC regulatory procedures, withdraw or amend the approved ECC recommendation on indoor commercial in-band PL use in order to guide operations outside of the band 1559-1610 MHz (and all RNSS and ARNS bands) on a frequency neutral basis;
 - Rationale: The underlying ECC technical and regulatory framework studies supporting ECC Recommendation 11(08) acknowledge that:
 - “Potential degradation and interference . . . may be significantly increased if indoor PL do not use dedicated codes for PLs as reserved in the Interface Control Documents (ICD) published by the GNSS system operators;”
 - » To our knowledge, this significant increase in interference has not been examined and therefore ECC Rec 11(08) should be withdrawn or amended.
2. *If ETSI is developing a commercial product standard* (DTR/SES-00321; STF TR 101 610):
 - Seek to address commercial PL network operations on a frequency neutral basis outside of the band at 1559-1610 MHz (and all RNSS and ARNS bands).