



GPS Innovation Alliance

Current Approach to RED Implementation, If Unaddressed, Would Threaten GPS/GNSS Use of RNSS Spectrum For ALL Stakeholders – Not Only Commercial And Consumer Receivers Covered Under RED

GPS Innovation Alliance (GPSIA)

Presentation to the Positioning, Navigation, and Timing Advisory Board

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Key RED Legal Requirement For EU Market Entry

- RED Essential requirement *for avoidance of harmful interference* (Article 3.2)
- Manufacturer can declare conformity with a RED harmonized product standard (“EN”) for presumption of conformity with RED Article 3.2
 - European Telecommunications Standards Institute (“ETSI”) develop EN
 - EN attain legal certainty when cited in the Official Journal of the EU (“OJEU”)
- RED includes Radiodetermination, e.g., RNSS where GPS/GNSS operate
 - RED covers commercial/consumer GPS/GNSS receivers: not aviation, maritime safety-of-life, military receivers
- RNSS bands have a co-primary ITU allocation (ARNS)
 - No ITU allocation for terrestrial channelized communication
 - ITU definition of harmful interference
 - *“Interference which endangers the functioning of a radionavigation service or of other safety services or seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service operating in accordance with Radio Regulations. 1.169”*
 - As there is no ITU allocation, a non-conforming use must not cause interference to, and must accept interference from, the primary use

RED Essential Requirement For Avoidance of Harmful Interference (Article 3.2) For Market Entry Only: It Does Not Introduce Spectrum Use Regulation

- RED Article 3.2 cited OJEU May 2014:

“Radio equipment shall be so constructed so that it both effectively uses and supports the efficient use of radio spectrum in order to avoid harmful interference.”

- The following RED recital treatment of receivers are informative references, and are not part of, RED Article 3.2:
 - “*Whereas*” Recital (10): “in the case of the receiver, it has a level of performance that allows it to operate as intended and protects it against the risk of harmful interference, in particular from shared or adjacent channels, and, in so doing, supports improvements in the efficient use of shared or adjacent channels.”
 - ” *Whereas*” Recital (11): “Although receivers do not themselves cause harmful interference, reception capabilities are an increasingly important factor in ensuring the efficient use of radio spectrum by way of an increased resilience of receivers against harmful interference and unwanted signals on the basis of the relevant essential requirements of Union harmonization legislation.”

RED GNSS Receiver Standard, EN 303 413 (OJEU 12/2017)

- EN 303 413 was developed in ETSI Technical Committee (SES SCN)
 - GPSIA participates, encouraged by EC Galileo representatives
- EN 303 413 uses
 - Internationally developed and adopted standards (including by EU Member States):
 - GNSS receiver parameters
 - International standard for determining avoidance of harmful interference (RED Article 3.2): 1 dB degradation in C/N_0
 - Adjacent frequency band selectivity test based on international allocations
- EN 303 413 was cited in the OJEU 12/2017 and is in force for covered GNSS receivers

EC Mandated Revision of EN 303 413 To “Improve” GNSS Receiver Performance

- In return for OJEU citation, EC mandated ETSI TC SES to open a new work item (ETSI REN-SES 00445) to revise EN 303 413 to “improve” GNSS receiver performance:
 - Mandates use of ETSI guide EG 203 336 to assess EN 303 413
 - Requires misapplication of “classical” radiocommunication receiver parameters, e.g. “*receiver sensitivity and co-channel rejection*” (note: RNSS bands not channelized) for use in determining avoidance of harmful interference (in lieu of the international standard of 1 dB C/N₀)
 - Now requires application of all (10) receiver parameters for terrestrial channelized communication, including assignment of values and minimum performance levels
- Technical Committee SES SCN has an “early” draft revision of EN 303 413 that:
 - Addresses receiver sensitivity and co-channel rejection with no values assigned
 - Provides rationale for why these classical communication receiver parameters do not apply to GNSS receivers
 - Conforms to the “exclusion” provision for Radiodetermination in ETSI guide 203 336
- Challenge: In a recent meeting with the EC, ETSI representatives of Technical Committees, including SES (e.g. Space Radiocommunication) presented similar rationale that has not been accepted
 - EC and EC consultants are not Radiodetermination/RNSS/GNSS technical experts

EC Mandate 536 Interpretation of RED Article 3.2 Introduces Regulation of Receiver Performance To Allow Shared Spectrum Use

- EC M/536 (OJEU Aug 2015) mandates European standards organizations to develop RED harmonized standards and is being read to recast RED recitals 10, 11 as prescriptive, as follows, to introduce regulation of receiver performance to accommodate interference from allowing shared spectrum use
 - “[M]odified essential requirement set out in Article 3.2 which has introduced requirements on receiver performance.” Justification for this modified essential requirement is provided in recitals 10 and 11. . .”
 - “[T]he development of sharing mechanisms and mitigation techniques should be a constant priority in order to achieve the efficient use of radio spectrum, in line with the electronic communication regulatory framework including the Radio Spectrum Policy Programme (RSPP), considering the need to increase sharing capabilities of equipment”

EC Assesses RED EN For Conformity with M/536 RED Art.3.2
Using ETSI Guide 203 336

- ETSI EG 203 336: “*Guide for the selection of technical parameters for the production of harmonized Standards covering . . .article 3.2”* was developed by ETSI Technical Committee ERM (Radio Spectrum Matters)
 - Omits key Stakeholders in RED regulatory framework: e.g., Radiodetermination/GNSS; Space Radiocommunication technical receiver parameters
 - Includes only “classical” radiocommunication (terrestrial channelized communications) receiver parameters
 - Amplifies receiver requirements for allowing spectrum sharing from M/536:
“Receivers usually operate under spectrum conditions managed by radio regulators to use spectrum efficiently and share with current & future users. The receivers should be specified in order to use the spectrum as intended while respecting these spectrum use conditions”
- EG 203 336 Includes helpful “exclusion” for Radiodetermination that the EC has yet to accept:
“Classical “ parameters for a radiocommunications receiver provided in the present document are not relevant for some types of equipment (e.g. radar [Radodetermination]) the Technical Body should include suitable alternative technical means in the harmonized standard.”

If Unaddressed, Current Approach To Implementing M/536 Article 3.2 in EN 303 413
Would Impact GPS/GNSS Use of RNSS Spectrum For ALL Stakeholders

- If the EC overrules TC SES SCN and decides in the revision of EN 303 413 to misapply channelized communication receiver parameters to GPS/GNSS receivers operating in non-channelized RNSS bands and assigns values and minimum performance levels to each parameter to accommodate in-band spectrum sharing, this would:
 - **Undermine the globally harmonized RNSS spectrum allocation** and effectively render ITU co-primary RNSS use secondary with implications for GNSS Stakeholders (e.g., aviation (ICAO), maritime safety-of-life) explicitly not covered within scope of RED
 - **Replace International RNSS standard for determining harmful interference** and lead to substantial increases in the noise floor for RNSS bands of harmful interference in excess of international standard 1 dB degradation in C/N_0
 - **Allow the noise floor to rise throughout each RNSS frequency band covered in EN 303 413** causing harmful interference to interoperability and ALL GPS/GNSS Stakeholders
 - **Effectively assert European unilateral regulatory jurisdiction over the Global GPS/GNSS spectrum environment**
 - Periodically increase minimum performance levels of receiver parameters (e.g., potentially every 2 to 3 years) *leading to GNSS receiver redesign* (not for user driven innovation) affecting ALL GPS/GNSS Stakeholders

Increases in the noise floor endanger the function of radionavigation RNSS/GPS/GNSS for all stakeholders, including GNSS stakeholders not covered under RED

ETSI Proposal To Revise ETSI Guide 203 336
Could Make Progress

- GPSIA supports revision of ETSI EG 203 336 and has proposed text to address the newly explicit RED category, Radiodetermination/RNSS/GNSS
- Not all ETSI Working Group members are in favor of changing the ETSI guide
- Meetings and further discussion are scheduled well into 2019

If explanatory revision of EN 303 413 now under development in ETSI Technical Committee SES SCN were to be accepted, the issues over revision of ETSI guide 203 336 become moot for Radiodetermination/RNSS/GNSS

Path Forward

- The EC would agree to cite the current TC SES SCN revision of EN 303 413 (ETSI REN SES 00445) in the OJEU:
 - Includes receiver sensitivity and co-channel rejection and no values assigned
 - Includes rationale for why channelized terrestrial communication receiver parameters do not apply to Radiodetermination/RNSS/GNSS receivers
 - Cites exclusion provision for Radiodetermination from ETSI guide EG 203 336
- Recommend USG GPS/GNSS Stakeholder engagement with EU, EU Member States, EC at decision level to ensure continued availability of the GPS/GNSS spectrum environment to support your mission(s):
 - Space Council (USAF Space; DOD Space): if unaddressed, Europe would effectively assert unilateral regulatory jurisdiction over the global GPS/GNSS and Space Radiocommunication spectrum environment in a manner that could undermine the global harmonized spectrum allocation and interoperability
 - DoT/FAA: if unaddressed, current approach to RED implementation of M/536 using EG 203 336 could require RNSS to accommodate interference from unlicensed channelized communication networks in restricted RNSS bands
 - Commerce/USTR/State: if unaddressed, current approach to RED implementation would effectively unilaterally regulate GPS/GNSS receiver performance and design—not to support user-driven GPS/GNSS innovation—but to support introduction of terrestrial channelized communications