

Protection of RNSS Systems

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Overview

- How to Protect RNSS Systems?
- Current Activities
- What is ICG?
- Spectrum Protection Activities in ICG
- National Legal Status Examples

How to Protect RNSS Systems?

- ITU spectrum management is generally working. Almost no international/cross-border interference concern is expected.
- Potential threats to RNSS (e.g., jamming) are currently limited to local incidents – Responsible for local spectrum management by national spectrum agencies
- Each national spectrum agency is working against such local incidents in different manner
- To share the knowledge among different countries, International Committee on Global Navigation Satellite System (ICG) is contributing.

Current Activities (1 of 2)

- Interference Reporting -

- U.S. GPS case

Interference report via internet or phone call

<http://www.navcen.uscg.gov/?pageName=gpsUserInput>

- Similar to GPS case, interference reports are collected by Chinese COMPASS and European GNSS Service Center

<http://en.beidou.gov.cn/index.html>

<http://www.gsc-europa.eu/helpdesk/incidents-report>

- Other RNSS systems are also investigating similar services
- Harmful interference report of ITU (Appendix 10 of RR) is also introduced in ICG and recognized by RNSS community

Current Activities (2 of 2)

- Interference Detection and Mitigation -

- Not only waiting for interference reports, more proactive interference detection technology and system are now being investigated
 - ▶ Several countries are currently conducting various trials on RNSS interference detections
 - ▶ Within ICG, potential international cooperation of interference detection is also discussed
- Many kinds of interference mitigation techniques such as smart RNSS antenna are now being investigated

What is ICG?



International Committee on
Global Navigation Satellite Systems

- International Committee on Global Navigation Satellite System (ICG) was established under the umbrella of United Nations' Committee on the Peaceful Uses of Outer Space (UN-COPUOS),
 - Promote the use of GNSS and its integration into infrastructures, particularly in developing countries
 - Encourage compatibility and interoperability among global and regional systems
- In the multiple occasions of ICG, the importance of ITU's regulatory works is also introduced.



Spectrum Protection Activities in ICG

- ICG provides forums for RNSS community,
 - 1) to increase the knowledge for the protection of RNSS spectrum and
 - 2) to encourage the continued access to benefits of RNSS
- IDM (Interference Detection and Mitigation) workshops
- ICG Expert Meeting in Dec. 2015 – Provided educational seminar to multiple RNSS stake holders
- Example topics discussed at ICG:
 - Impact from Electromagnetic Emissions
 - Interference Detection and Geo-Location Capabilities
 - Importance of National Spectrum Management

National Legal Status Examples(1 of 2)

- Jammers -



Jammers	US	RU	China	EU
manufacture	illegal	illegal	illegal	Nation-by-nation
sell	illegal	illegal	illegal	illegal
export	illegal	illegal	illegal	Nation-by-nation
purchase	Undefined (consumer import illegal)	illegal	illegal	illegal
own	legal	Undefined	Undefined	legal
use	illegal	illegal	illegal	illegal

National Legal Status Examples (2 of 2)

- Short Range Devices -

- Different regulatory authorization for RNSS repeaters among countries – to protect RNSS signals, national regulations should ensure that RNSS repeaters are deployed only where RNSS signals cannot reach (e.g., underground or deep indoor locations) and that each device is uniquely authorized and registered so that it cannot be used elsewhere
- Unique Short Range Device regulations such as US Federal Regulations Title 47, Part 15

Summary (1 of 2)

- Interference reporting and detection are important start points for GNSS spectrum protection
- In addition to ITU spectrum management, national law enforcement will play significantly important roles for GNSS spectrum protection but can be different among countries
- In addition to national telecommunication regulations, other regulations such as sales, import/export etc. are required to prevent access to jammer devices and to limit the potential for other sources to interference with GNSS systems

Summary (2 of 2)

- Many organizations, including UN-COPUOS ICG, are currently working to support the protection of RNSS systems, for the purpose of increasing the knowledge about RNSS spectrum protection
- ITU is also expected to provide significant contributions to appropriate spectrum management for ensuring the continued access of RNSS benefits, in cooperation with national spectrum agencies and other international organizations