United States
GPS Industry Council

January 7, 2011

3GPP TSG-RAN WG4 Chairman
Mr. Takaharu Nakamura
n.takaharu@jp.fujitsu.com

cc
3GPP TSG-RAN Chairman
Mr. Takehiro Nakamura
nakamurata@nttdocomo.co.jp

3GPP TSG-SA Chairman
Mr. Stephen Hayes
Stephen.hayes@ericsson.com

Dear Mr. Nakamura:

The United States Global Positioning System (GPS) Industry Council ("USGPSIC") is an industry body representing manufacturers of user equipment for an installed user base in the United States and worldwide that depends on the uninterrupted availability of signals from GPS and Global Navigation Satellites Systems (GNSS).

We understand that the 3rd Generation Partnership Project (3GPP) Technical Specification Group-Radio Access Network (TSG-RAN) Working Group 4 (WG4) is developing modifications to 3GPP technical specifications to include terrestrial mobile systems operating in the "L-band" in the United States. Specifically, we understand that Release 10 of the 3GPP specifications will address base station operation in 1525 to 1559 MHz, which is adjacent to the Radionavigation Satellite Service (RNSS) L- band[1] in which GPS, and GNSS, operate. Terrestrial mobile user equipment (UE) operates in 1626.5 to 1660.5 MHz.

[1] The Radionavigation Satellite Service ("RNSS") band ranges from 1559 to 1610 MHz and GPS (L1) operates with a center frequency of 1575.42 MHz, with the Course/Acquisition code occupying a bandwidth of 2.046 MHz and the Precision code occupying a bandwidth of 20.46 MHz

2000 K Street, NW • Suite 600 • Washington, DC 20006-1809
Tel. (202) 416-6282

As noted in a recent filing to the Federal Communications Commission (FCC)[2] in response to the FCC's mobile-satellite services (MSS)/ancillary terrestrial component (ATC) L-band operator's, LightSquared's, application to the FCC for a waiver of its ATC rules to enable wide scale use of this MSS L-band for co-primary terrestrial services[3], we have significant technical concerns about the use of spectrum adjacent to the RNSS band, originally allocated for satellite downlink services, for a co-primary high-capacity, densely populated network of high power terrestrial base stations. Authorization of a co-primary terrestrial wireless service with base station transmissions in a band allocated to primary space-based service use (MSS) introduces a different technical problem for the GPS/GNSS receivers operating in the adjacent RNSS L-band that is not addressed by improving the out-of-band emission (OOBE) limits for transmitters. Analysis shows that high power terrestrial transmissions in the 1525-1559 MHz band may introduce significant receiver blocking issues for GPS/GNSS receivers, therefore additional mitigation measures need to be taken to protect the availability, and utility, of the GPS/GNSS signals for the installed user base.

Legacy GPS receivers, systems, and networks are deployed in a wide range of diverse applications, such as: consumer devices, including E911 cell phones; personal medical alert location devices; parolee monitoring; location based services (*e.g.*, social networking sites); public safety: police fire paramedic ambulance dispatch and monitoring; disaster response and mitigation; fleet dispatch and asset management; public transportation; systems and networks providing dynamic precision accuracy: precision construction, machine control, structural deformation monitoring; science and environmental monitoring; geographic information systems (GIS); surveying; mapping; critical infrastructure: timing of electrical power grids; banking; etc. Since the first GPS product was introduced for survey use for a U.S. Federal agency, GPS products, systems, networks and consumer devices were designed with the assumption that this adjacent band would be primarily used for satellite downlink services. When the Ancillary Terrestrial Component ("ATC") usage was authorized by the FCC in 2002, it was allowed on a secondary use basis as a "gap-filler" in urban areas for the primary MSS use in urban areas and

---

[2] Comments of the US GPS Industry Council, December 2, 2010 in FCC file SAT-MOD-20101118-00239, available at http://licensing.fcc.gov/myibfs/download.do?attachment_key=854795.

[3] *See* Comments of AT&T, Inc. (available at http://licensing.fcc.gov/myibfs/download.do?attachment_key=854805), CTIA – The Wireless Association (available at http://licensing.fcc.gov/myibfs/download.do?attachment_key=854771), Iridium Satellite LLC (available at http://licensing.fcc.gov/myibfs/download.do?attachment_key=854468), Verizon Wireless (available at http://licensing.fcc.gov/myibfs/download.do?attachment_key=854636) and Petition to Deny of WCA International (available at http://licensing.fcc.gov/myibfs/download.do?attachment_key=854451), each filed December 2, 2010, and the Ex Parte letter of Motorola dated December 22, 2010 (available at http://licensing.fcc.gov/myibfs/download.do?attachment_key=857775), all in FCC file SAT-MOD-20101118-00239.

the handsets were authorized to be MSS/ATC exclusively. The OOBE limits for GPS in the existing MSS/ATC license in the L-b and were developed in 2002 based on these operating conditions.

As there is significant potential for the proposal to operate 3GPP systems on a co-primary terrestrial service use in the L band to cause harmful interference to the large installed base of GPS/GNSS users whose daily operations depend on receiving the positioning, navigation, and timing information from the GPS satellite signals, we would like to know if WG4 has studied coexistence issues from both an out-of-band emissions and maximum allowed power at a GPS/GNSS receiver point-of-view?

If your WG has studied or is studying the potential interference impact, could you kindly provide us reference to the results so we can appreciate how coexistence is ensured? We would like the opportunity to review such information and will, if appropriate, provide comment on any assumptions made to ensure the studies properly reflect deployed GPS receivers, systems, and network performance across the diverse range of installed applications.

If your WG has not studied the impact, then could you confirm if WG4 intends to fully study legacy GPS coexistence before 3GPP officially publishes the specifications that introduce the proposed terrestrial wireless operations on a co-primary use for this L-band?

The US GPS Industry Council would appreciate a response by April 30, 2011.

Very truly yours,

F. Michael Swiek
Executive Director,
U.S. GPS Industry Council
mswiek@mike-intl.com