NPSTC is a federation of organizations whose mission is to improve public safety communications and interoperability through collaborative leadership.

GPS TWG Sends Report to FCC: Controversy Continues

Background: *LightSquared is a company that has spectrum in the 1.5 GHz band adjacent to the spectrum used by all Global Positioning System (GPS) receivers. LightSquared plans to build an LTE terrestrial network with approximately 40,000 sites which would provide wholesale capacity to commercial broadband providers. This could radically change and degrade the spectrum environment in which adjacent GPS signals are received, as strong signals from the LightSquared facilities could block GPS reception by public safety communications facilities and devices.*

In January 2011, NPSTC wrote to the FCC raising concerns about the potential for interference. Accurate GPS information is very important to the public safety community. GPS is used for wireless 911 location, support of dispatch operations, mapping/response directions to responders, and synchronization of simulcast systems across the country. The FCC subsequently required LightSquared (LS) to test for interference to GPS and submit a report by June 15, 2011, to document the potential for interference and recommended mitigation procedures. NPSTC participated in the GPS Technical Working Group (TWG, co-chaired by LS and the U.S. GPS Industry Council to assess the potential for interference.

June 15, NPSTC Submits Letter to FCC Outlining Public Safety Concerns Regarding Interference to GPS Services Due to Terrestrial LTE Operations on Adjacent L-Band Allocations: The public safety report concluded that theoretical analysis; organized, industry-wide and individual company laboratory testing; and fielded, Live Sky testing has indicated that terrestrial use of L-band allocations near accepted and utilized Satellite Navigation allocations (1559 – 1610MHz), including GPS, does diminish location accuracy and / or preclude, under certain circumstances, GPS service entirely. Each impacted device will exhibit a denial of service radius. The report and other relevant materials can be found on **NPSTC GPS Interference Working Group** page. [Cl*ick on Filings and Letters, Final Report Filed with FCC, June 15].*

NPSTC cited interference to infrastructure such as roof- and tower-mounted antennas, mobile PC-based and stand-alone devices, portable handsets, and E911 calls. NPSTC was concerned

that more testing on public safety systems was not done in the extremely expedited schedule under which the TWG conducted testing.

June 15, FCC Grants LS Request To Extend GPS TWG Report Deadline: One of the reasons for the delay was that LightSquared determined that additional testing, including alternative frequency plans to support its network, was necessary to permit a proper evaluation of various mitigation options for addressing the GPS receiver issue.

June 30, LS GPS TWG Submits Report to FCC: On June 30, 2011, LS filed the 1,000-plus page TWG report analyzing interference from LS's proposed deployment plans in the Mobile Satellite Service (MSS) band adjacent to GPS. The report was based on their February 2011 planned three-phase deployment. All three phases identified by LightSquared for study used a portion of the MSS band directly adjacent to GPS, 1545.2-1555.2 MHz. The test results showed overwhelming interference to every category of the 500 million GPS receivers.

June 30, LS Submits Alternative Plan: LS had stated previously that its proposed plans would not interfere with GPS; however in light of the evidence of massive interference, LS also released a 58-page Alternative Recommendation Document. LS submitted a report on its proposed wireless broadband network that calls on the Commission to approve the company's revamped service plan under which it would use 10 MHz of spectrum in the lower L-band to launch its wholesale wireless broadband service. LS said it agreed that the 10 MHz of spectrum that make up the upper L-band was not usable for its service now because it would "adversely affect the performance of a significant number of legacy GPS receivers." However, the company stressed that use of the lower part of the band would not hinder the performance of 99.5% of GPS receivers.

LS also asked the GPS industry to help it solve interference problems, while taking aim at the industry for not seeking a resolution to those problems earlier.

June 30, FCC Sets Comment Deadlines of July 30 on LS GPS TWG Report; Replies Due August 15, 2011: On June 30, 2011, LS submitted a final report that includes the working group's analyses of the potential for overload interference to GPS devices from LS's terrestrial network of base stations, technical and operational steps to avoid any such interference, and specific recommendations going forward to mitigate potential interference to GPS devices.

According to the FCC notice, the TWG effort identified significant technical issues related to potential LightSquared operations in the upper portion of the L-Band, which is most proximate to the band used by GPS. Over more than 3 months, the technical working group tested more than 130 representative devices in seven different receiver categories, in a number of different test environments. The tests demonstrated potentially significant interference between LS operations in the upper portion of the band and various GPS receivers. The tests also identified some interference issues in the lower 10 MHz portion of the band. The overall conclusion of the testing is that transmissions in the upper 10 MHz channel —the channel nearest to the 1559-1610 MHz GPS band — will adversely affect the performance of a significant number of legacy GPS receivers.

In addition to the TWG report, LS submitted its recommendations to address the problems identified by the working group, indicating its willingness to operate at lower power than permitted by its existing FCC authorization; to agree to a "standstill" in the terrestrial use of its Upper 10 MHz frequencies immediately adjacent to the GPS band; and commence terrestrial commercial operations only on the lower 10 MHz portion of its spectrum and to coordinate and share the cost of underwriting a workable solution for the small number of legacy precision measurement devices that may be at risk.

The FCC invited comment on these recommendations, including any alternative proposals to enable these two important services – GPS devices and L-band mobile broadband – to co-exist, and welcomed comments on the TWG report generally.

July 7, LS Announced Empower Rural America Initiative, which will, "work with LightSquared and other parties to make sure device filters and other approaches are developed that will resolve any GPS issues related to precision agriculture and other areas;" and "ensure that LightSquared's integrated satellite network can help rural markets augment their broadband and GPS services to provide greater accuracy and continuity of service."

July 7, NTIA Says Additional Testing Should be Done on LS Alternative Plan: The National Telecommunications and Information Administration said it agrees that additional testing should be done to gauge the impact of LS' alternative deployment of its L-band system, which the company said will protect most GPS receivers. NTIA submitted a report to the FCC conducted by the National Space-Based PNT Systems Engineering Forum (NPEF) on LS's network. As reported in TRDaily, independent testing done by NPEF concluded that LightSquared's network would impact all GPS receiver applications. However, the NPEF did not test the alternative deployment LightSquared is now planning, which involves an initial deployment on 10 megahertz of spectrum lower in the 1525-1559 MHz band.

July 19, Europeans Weigh In: The European Commission (EC) expressed "deep concerns" that LightSquared, Inc.'s L-band network would cause interference to the Galileo European global navigation satellite system and the European Geostationary Navigation Overlay Service (EGNOS). The EC's letter to the FCC stated that LightSquared's "proposal for a terrestrial network deployment in the MSS spectrum would completely change the nature of radio transmissions in the band. What are now neighbour MSS transmissions at similar receiver power levels to RNSS [radio navigation satellite service] would in [the] future be many orders of magnitude higher and with the potential to severely disrupt reception of RNSS signals."

July 30, NPSTC Files Comments on LS New Plan: NPSTC submitted comments to the FCC stating, "...it is clear that the testing done to date confirms significant interference problems will occur if LightSquared's upper channel is deployed. NPSTC would like equal assurance that interference problems will not occur when only the lower channel is deployed and believes additional testing and analysis of the results is needed under a rational schedule. NPSTC appreciates LightSquared's proposal for a "standstill period" during which its upper channel would not be deployed, but NPSTC believes additional detail is needed to help ensure no

interference to public safety will occur if and when the Commission does authorize use of the upper channel."

NPSTC also noted the very compressed time schedule allotted for testing and asked that more public safety devices be tested and that more time be provided to review and analyze the test results. "While the Technical Working Group testing encompassed 130 devices overall, only six were in the public safety category. Testing of a larger group of public safety devices could not be accommodated under the compressed schedule imposed."

NPSTC believes that additional testing will need to be completed to evaluate LightSquared's modified deployment proposal. "Full testing needs to be performed in both the lab and open air environment .... including both urban and suburban areas of deployment without artificially limiting the scope of public safety devices because of compressed schedules." Such tests should also be conducted with LightSquared's licensed power and its proposed reduced power.

The member organizations of the National Public Safety Telecommunications Council are grateful to the Department of Homeland Security, Office for Interoperability and Compatibility (OIC) and Office of Emergency Communications (OEC) for their support to this volunteer public safety organization.