

Advertisement

A new and innovative community forum is ready for launch.

WILL YOU BE ON BOARD?



www.hostedpayload.com

Get ready to contribute.

Presented by:



Fri, 10 June, 2011

Reports: LightSquared Plan Poses Unacceptable Risk to GPS Service

By Turner Brinton



Deane Bunce. Credit: Space News photo by James J. Lee

[Enlarge Image](#)

WASHINGTON — Disruption of GPS positioning and navigation signals used for aviation and other applications within U.S. territory will be unavoidable if startup firm LightSquared is permitted to deploy a hybrid satellite-terrestrial broadband network as currently planned, a pair of technical reports released June 9 concluded.

The reports, one by a White House-chartered panel and the other by a technical association that supports U.S. federal agencies, come in advance of an analysis of the interference issue being conducted by a technical working group led by LightSquared and including government and industry experts. That analysis is due June 15 to the U.S. Federal Communications Commission (FCC), which is weighing whether to levy additional licensing requirements on the struggling company.

After considering what they said were all possible mitigation options including reducing the power of the planned LightSquared base stations and outfitting GPS receivers with special filters, the authors of both newly released reports found there is no practical way for the high-power LightSquared terrestrial network to coexist with myriad applications that rely on relatively low-power GPS signals in an adjacent part of the electromagnetic spectrum.

Reston, Va.-based LightSquared and its predecessor companies since 2003 have been planning a nationwide L-band mobile broadband communications network that relies on a pair of large geostationary-orbiting satellites and tens of thousands of broadcast towers on the ground. The company has invested roughly \$1 billion so far, has one satellite in orbit, and is seeking several billion dollars of additional financing for the ground-based portion of its network.

Jeff Carlisle, LightSquared's vice president of regulatory and public affairs, did not dispute the specific technical methods or findings of either report. But he said the interference issue could be mitigated by network modifications including lowering the power ceiling for the ground-based transmitters of LightSquared's network.

LightSquared's FCC operating license originally included strict provisions intended to ensure the network would be primarily a satellite-based system, with terrestrial components serving as a backup when users were not able to link with a satellite. But these provisions have been softened over time via several license modifications; most recently, the FCC granted LightSquared permission to sell terrestrial-only handsets, a concession the company said would help it raise the financing it needs.

But the move alarmed the GPS community, which worries it could lead to mass adoption of the service and drive LightSquared to increase the power of its broadcast towers, affecting more and more GPS users. These concerns, formally registered with the FCC, triggered a detailed technical investigation of LightSquared's potential impacts on both civil and military GPS users.

The investigation, featuring laboratory and field experiments, has been carried out over the past several months by teams from both military and civil agencies as well as from industry. U.S. Air Force Gen. William Shelton, commander of Air Force Space Command, in May told the Senate Armed Services Committee that military, civilian and commercial GPS receivers experienced interference during the tests.

The final results of the testing showed significant impacts on many civil applications such as air traffic control and emergency response, said Deane Bunce, co-chair of the White House-chartered National Space-

Advertisement



DOWNLOADS /

[Resource Center](#)

CALENDAR /

[Upcoming Events](#)

INDUSTRY CONTACTS /

[Space Directory](#)

FOLLOW US /

[twitter](#)

FREE Webcast
 Space News Online Newsroom Forum
 Trends in Global Mobile
 Satellite Communications
 Wednesday, May 18, 2011 • 11 am EDT
 Featuring
 Peter de Selding and Andrew Sukawaty



arianespace
service & solutions
www.arianespace.com

Based Positioning, Navigation, and Timing Systems Engineering Forum, or NPEF, which coordinated the testing among U.S. civil agencies. NPEF, a White House-chartered panel that provides technical analysis for GPS-related issues, submitted its final report to the FCC on June 1 and soon expects to publicly release a redacted version, Bunce said during a meeting of the National Space-Based Position, Navigation and Timing Advisory Board here.

In simulating the deployed LightSquared network with the most current information available from the firm, NPEF found that aviation users could effectively experience a blackout of GPS capabilities, particularly around densely populated areas, where LightSquared ground stations are expected to be spaced 400 to 800 meters apart, Bunce said.

At altitudes of 3,040 meters and below, aircraft could not rely on GPS for navigation over the nation's capitol, most of Virginia and Maryland, and significant parts of Pennsylvania and New Jersey, according to a graphic shown during Bunce's presentation. Bunce noted that particular scenario used the GPS aviation receiver that performed worst in testing and thus represented the worst-case scenario.

The NPEF report also showed police cars could not acquire GPS signals within 182 meters of a LightSquared tower broadcasting at the maximum allowed power of 15 kilowatts, Bunce said. Signals to ambulances and fire trucks were nullified within 304 meters of a tower, he said.

There are no feasible options for mitigating LightSquared interference, Bunce said. Analyses indicate that outfitting all GPS aviation receivers with special filters to ensure they do not pick up LightSquared signals would take between seven and 15 years and cost an unknown but extremely large sum, he said. Furthermore, the filters would reduce receiver performance, he said.

Other options, such as modifying LightSquare antenna patterns and exclusion zones or operating at lower power levels, are not good solutions because they would require more ground stations to be deployed, increasing the aggregate power output of the system, Bunce said.

The only remaining viable solution, Bunce said, would be for LightSquared to acquire the rights to another part of the electromagnetic spectrum in which to deploy its ground network, Bunce said.

A separate report submitted to the FCC June 1 by the Radio Technical Commission for Aeronautics came to similar conclusions. All GPS aviation receivers tested by the organization experienced an unacceptable level of signal degradation, said Robert Frazier, who led the report for the nonprofit corporation, which develops consensus-based engineering recommendations for the Federal Aviation Administration.

The LightSquared terrestrial network would use two specific L-band frequencies. The report recommended that LightSquared not be permitted to transmit in the higher of these two frequencies, Frazier said.

RELATED ARTICLE

[*Opinions Differ on Mitigation Options for LightSquared Interference*](#)

[*LightSquared Plans Hinge on Outcome of GPS Interference Debate*](#)

COMMENTS (0)

You must be logged in to post a comment: [Log In](#) | [Register](#)
[Post a Comment](#)

POST A COMMENT

You must be logged in to post a comment: [Log In](#) | [Register](#)

You are currently not logged in.
You must be logged in to leave a comment.

submit

User Comment Guidelines: It may take up to a minute for your comment to appear. Posting of comments requires membership in the Imaginova Community, which is subject to our [Terms of Service](#). Imaginova reserves the right to remove, without notice, any comment for any reason whatsoever.



[About Us](#) | [Contact Us](#) | [Privacy Policy](#) | [Terms & Conditions](#) | [Advertise With Us](#) | [DMCA/Copyright](#) | [Subscription Agreement](#) | [Archives: 05,06,07,08,09](#)

© Imaginova Corp. All rights reserved.