UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Communications and Information
Washington, D.C. 20230

JAN 12 2011

Mr. Julius Genachowski
Chairman
Federal Communications Commission
445 12th Street, SW
Washington, D.C. 20554

Dear Chairman Genachowski:

The National Telecommunications and Information Administration (NTIA), in consultation with the Federal agencies, has reviewed the Federal Communications Commission (FCC) Public Notice requesting comments on an application by LightSquared Subsidiary LLC (LightSquared) to modify its authority to provide mobile-satellite service/ancillary terrestrial component (MSS/ATC) service. In our view, this proposal raises significant interference concerns that warrant full evaluation as part of the FCC's consideration of LightSquared's application to ensure that LightSquared services do not adversely impact Global Positioning System (GPS) and Global Navigation Satellite System (GNSS) receivers, maritime and aeronautical emergency communication systems, and Inmarsat receivers used by the Federal agencies.[1]

Grant of the LightSquared waiver would create a new interference environment and it is incumbent on the FCC to deal with the resulting interference issues before any interference occurs. Several Federal agencies with vital concerns about this spectrum band, including the Departments of Defense, Transportation and Homeland Security, have informed NTIA that they believe the FCC should defer action on the LightSquared waiver until these interference concerns are satisfactorily addressed.[2] If the FCC grants the requested waiver despite the views of the agencies it should, as part of the grant, establish a process (i) that will ensure the interference issues (including fundamental concerns about interference with GPS safety-of-life applications) are resolved prior to LightSquared's offering service that could cause interference, and (ii) that motivates all parties to move expeditiously and in good faith to resolve the issues. NTIA stands ready to work with the FCC, LightSquared, the affected communities and concerned Federal agencies to address the interference concerns discussed herein.

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1. *See* Federal Communications Commission Public Notice, SAT-MOD-20101118-00239, Report No. SAT-00738 (rel. Nov. 19, 2010); *See* Letter from Jeffrey J. Carlisle, Executive Vice President, Regulatory Affairs and Public Policy, LightSquared, to Marlene H. Dortch, Federal Communications Commission, dated November 18, 2010 ("LightSquared November 18 Letter"); The GNSS is a satellite system that is used to provide position, navigation, and timing information to a user's receiver anywhere in the world. Two GNSS systems are currently in operation: the United States' Global Positioning System (GPS) and the Russian Federation's Global Orbiting Navigation Satellite System (GLONASS). A third, Europe's Galileo, is planned. Each of the GNSS systems employs a constellation of orbiting satellites working in conjunction with a network of ground stations. There are also ground-based and spaced-based augmentation systems.

2. *See,e.g.* Letter from Mr. Danny Price, Office of the Assistant Secretary of Defense; Director, Spectrum and Communications Policy to Mr. Karl B. Nebbia, Associate Administrator, NTIA Office of Spectrum Management, Department of Commerce, dated December 28, 2010, a copy of which is attached hereto.

In its application, LightSquared states that it will operate its network on a wholesale basis and make capacity available to wholesale customers who serve end-users.[3] Although LightSquared intends to make dual-mode handsets available to its wholesale customers, it has not made clear whether it will require its wholesale customers to offer dual-mode handsets to their end-users. If it does not require dual-mode handsets, LightSquared's wholesale customers will have the ability to offer terrestrial-only plans to their own end-users, permitting them to offer ATC-only subscriptions and potentially using 100 percent of their network capacity for terrestrial-only service.[4] The large increase in terrestrial usage that is expected to result from LightSquared's new business model creates a new and more challenging interference environment that must be addressed satisfactorily.

Concerning GPS protection, NTIA recognized in 2002 that facilitating the introduction of ATC services in spectrum used for MSS could lead to an attendant increase in interference to GPS receivers, such as Enhanced-911 (E-911) capable handsets and consumer navigation and location devices.[5] However, given the expected limited deployment of ATC base stations at that time under the FCC's orders granting ATC authority,[6] NTIA believed that the FCC could address the potential interference to GPS receivers by establishing limits on emissions in the GPS frequency bands. The FCC specified limits on the radiated power of out-of-band emissions in the 1559-1610 MHz band from ATC base and mobile stations[7] and also agreed to coordinate any ATC authority grant with NTIA, pursuant to the general notification process, to assure adequate protection of GPS services.[8] Consistent with this agreement, the FCC has required in all previous authorizations granted for ATC in the MSS bands that operations comply with more

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3. LightSquared is authorized to operate MSS/ATC base stations in the 1525-1559 MHz band and MSS/ATC mobile stations in the 1626.5-1660.5 MHz band.

4. *See* Section 25.149 of the FCC Rules. The FCC based its decision to permit implementation of MSS/ATC on the premise that ATC must be "ancillary" to MSS operation. To ensure that MSS/ATC allocation remains a satellite service, the FCC established gating requirements for MSS/ATC authorization and operation to ensure that MSS/ATC will augment, rather than supplant, MSS. To satisfy the gating requirements, an MSS licensee must, among other things, offer an integrated service of MSS and MSS/ATC by affirmatively demonstrating that the MSS/ATC operator will use a dual-mode handset that can communicate with both the MSS network and the MSS/ATC component to provide the proposed ATC service or by providing other evidence that the MSS/ATC operator will provide an integrated service offering to the public.

5. *See, e.g.,* Letter from Fredrick R. Wentland, Acting Associate Administrator, Office of Spectrum Management, National Telecommunications and Information Administration to Donald Abelson, Chief, International Bureau, Federal Communications Commission, IB Docket No. 01-185 at 1 (Nov. 12, 2002) .

6. *See Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Bands; Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands, Report and Order and Notice of Proposed Rulemaking,* FCC 03-15, 18 FCC Rcd 1962 (2003) (*ATC Report and Order*), modified by Order on Reconsideration, 18 FCC Rcd 13590 (2003), reconsidered in part in *Memorandum Opinion and Order and Second Order on Reconsideration,* FCC 05-30, 20 FCC Rcd 4616 (2005) at ¶ 71.

7. *See* Section 25.254(a)(4) and Section 25.254(b)(4) of the FCC Rules.

8. *See supra* note 5.

restrictive out-of-band emission limits in the 1559-1610 MHz band.[9] However, due to the radio frequency filters employed in GPS receivers, the signals from MSS/ATC base stations and mobile stations operating close to GPS and GNSS receivers could still cause in-band interference to the receiver.[10] The GPS and GNSS manufacturer and user communities have never raised the issue of in-band receiver interference during the previous MSS/ATC rulemaking proceedings. It is NTIA's view that the Federal and non-Federal GPS users and GPS manufacturers thought this problem was manageable under the original MSS/ATC concept where there would be a limited number of terrestrial base stations transmitting at a low duty cycle to fill gaps in MSS coverage. But as the number of terrestrial base stations increases and/or the duty cycle of base stations transmissions increases to support the proposed LightSquared terrestrial network, NTIA is concerned that the likelihood of GPS and GNSS receiver in-band interference will also increase.[11] While the distance where this interference occurs may vary based on the specific types of GPS applications considered, base stations situated in urban areas may never be far from GPS capable handsets. Furthermore, the large installed base of GPS-dependent devices makes this situation difficult to change over the short term.

Federal and non-Federal telecommunications systems depend on GPS timing receivers for synchronization to achieve a high degree of accuracy required by many of these systems. Degradation in performance, due to the introduction of interference can cause timing receivers to provide a low quality timing solution, or to lose lock with incoming GPS signals altogether. Section 25.253(c)(2) of the FCC Rules requires MSS/ATC applicants to coordinate with Commercial Mobile Radio Service base stations that use GPS timing receivers. LightSquared has indicated to NTIA that they will provide the technical information necessary for Federal entities to fully assess the potential impact to GPS timing receivers used by their telecommunication systems. As LightSquared makes this information available, NTIA will

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9. MSS/ATC base and mobile stations operating in the 1525-1559 MHz, 1626.5-1660.5 MHz, 1610-1626.5 MHz, 2000-2020 MHz, and 2180-2200 MHz bands are required to suppress the power of any emission in the 1559-1610 MHz band in accordance with the following equivalent isotropically radiated power (EIRP) density limits: the EIRP density for mobile stations is limited to -95 dBW/MHz for wideband emissions and -105 dBW/kHz for narrowband emissions; and the EIRP density for base stations is limited to -100 dBW/MHz for wideband emissions and -110 dBW/kHz for narrowband emissions.

10. The established out-of-band emission limits will not protect the GPS and GNSS receivers from in-band interference effects such as gain compression and intermodulation. Manufacturers have designed GPS receivers based on the interference environment, the size, cost and availability of filter technology, and on the requirements of the applications and missions they support. They based consideration of the interference environment on the allocated mobile satellite service, not on ubiquitous mobile broadband.

11. *See* Letter from Charles R. Trimble, Chairman, United States GPS Industry Council, to Karl Nebbia, Associate Administrator, Office of Spectrum Management, National Telecommunications and Information Administration dated December 13, 2010. NTIA has received letters from the Space-Based Positioning Navigation and Timing, National Coordination Office, the Office of the Assistant Secretary of Defense, the National Aeronautics and Space Administration, the Office of the Secretary of the Department of Transportation, the Office of the Secretary of the Department of Interior, and the Federal Aviation Administration, requesting that any FCC action on the LightSquared waiver request be deferred until the appropriate technical and/or regulatory mitigation measures can be developed to protect GPS operations. The Office of the Manager of the National Communications System made a similar request to defer the waiver until additional interference data is available.

review it and work with LightSquared to ensure that GPS timing receivers used by Federal telecommunication systems are protected.

LightSquared's application also implicates the bands 1545-1559 MHz and 1646.5-1660.5 MHz, which are allocated for aeronautical emergency communications in the Aeronautical Mobile-Satellite (Route) Service (AMS(R)S) for use during en-route oceanic flights, as well as the bands 1530-1544 MHz and 1626.6-1645.5 MHz which are allocated for maritime emergency communications and used by the U.S. Coast Guard as part of the Global Maritime Distress and Safety System (GMDSS). International footnotes 5.353A, 5.357, 5.362A, and domestic footnotes US308 and US315 specify requirements for the protection of the aeronautical and maritime safety services.[12] Because aeronautical and maritime safety communication requires international interoperability including "priority access with real-time preemptive capability" for AMS(R)S and GMDSS systems as recognized by the International Civil Aviation Organization and the International Maritime Organization, any change in the use of the bands 1530-1559 MHz and 1626.6-1660.5 MHz requires careful consideration. The proposal by LightSquared could result in a shift toward terrestrial-only operations and could for all practical purposes reduce or eliminate access to the spectrum by AMS(R)S and GMDSS operations. NTIA has expressed concerns in the past that an increase in non-safety operations, and the inability of some MSS systems to provide safety services, may limit spectrum access for the future growth of AMS(R)S and GMDSS emergency communications.[13] As the FCC considers changes from the original MSS/ATC concept for the bands 1525-1559 MHz and 1626.5-1660.5 MHz, the FCC and NTIA must work together to ensure that LightSquared's services do not degrade or limit present and future safety communication services operated consistent with the existing domestic policy.

A third issue raised by LightSquared's application is possible interference with Inmarsat services. The Department of Defense (DoD) has informed NTIA that its MSS earth stations using Inmarsat commercial services operating in the bands 1525-1544 MHz and 1626.5-1645.5 MHz require a high confidence of protection from interference for national security reasons, and that any deployment of ATC base stations must be contingent on reaching prior agreement with DoD in certain circumstances.[14] Additionally, the DoD has proposed specific requirements and considerations to facilitate the protection of their earth station receivers. Sky Terra Subsidiary LLC has been working with the DoD to ensure the successful co-existence between ATC

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12. Special protections and preemptive access are required for aeronautical and maritime safety services.

13. *See* Letter from Karl B. Nebbia, Associate Administrator, National Telecommunications and Information Administration Office of Spectrum Management, to Julius Knapp, Chief, Office of Engineering and Technology, Federal Communications Commission, dated May 13, 2009. In paragraph 5 of the letter it is stated that, "NTIA is concerned that an increase in MSS operations may limit spectrum access for the future growth of AMS(R)S and GMDSS emergency communications. Also, all MSS systems do not have the capability to provide AMS(R)S or GMDSS communications, and systems providing AMS(R)S and GMDSS may limit the channels assigned for these services. Spectrum utilized in these ways limit the amount of spectrum available for the future growth of emergency communications. If this becomes an issue, further discussions on intra- and inter-system priority access with real-time preemptive capability may be necessary."

14. *See* Letter from Mr. Danny Price, Office of the Assistant Secretary of Defense; Director, Spectrum and Communications Policy to Mr. Karl B. Nebbia, Associate Administrator, NTIA Office of Spectrum Management, dated March 19, 2010.

operations and Inmarsat earth station receivers.[15] NTIA and the DoD believed this problem was manageable under the original MSS/ATC concept, but the introduction of terrestrial-only handsets may increase the duty cycle of the base station transmissions and thus the probability of interference to Inmarsat earth station receivers. Inmarsat and LightSquared will need to continue to work with the DoD to resolve and identify the appropriate solutions necessary to protect DoD and other agency earth station receivers. This includes addressing any additional issues raised by the increase in base station transmissions to support terrestrial-only services. NTIA requests that the FCC ensure the resolution of this issue to the satisfaction of critical Federal users.

NTIA understood the original construct of MSS/ATC operations to be that they would operate as "satellite first/terrestrial second" systems. However, the many modifications, rule changes and waivers since the FCC adopted rules in 2003 to allow MSS/ATC more flexibility increase the risk of interference with existing services. Thus far, we have moved forward allowing deployment of ATC systems compatible with Federal systems maximizing the use of the available MSS spectrum. While NTIA has not previously contemplated the impacts of the introduction of terrestrial-only handsets in this band, we are willing to work with all those involved so that Federal operations are protected while allowing MSS/ATC flexibility. NTIA pledges to support the multi-party effort recommended above to ensure that the issues can be brought to closure as quickly as possible.[16] If you have any questions regarding these recommendations please feel free to contact me.

Sincerely,

Lawrence E. Strickling

Attachment

15. LightSquared was previously known as Sky Terra Subsidiary LLC.

16. *See also,* Letter from Mr. Sanjiv Ahuja, Chief Executive Office, LightSquared to the Honorable Lawrence E. Strickling, Assistant Secretary of Commerce for Communications and Information, dated January 6, 2011.

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NETWORKS AND
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Mr. Karl Nebbia
Associate Administrator
Office of Spectrum Management
National Telecommunications and Information Administration
U.S. Department of Commerce
Washington, D.C., 20230

Mr. Nebbia

I am concerned with the Draft Order and Authorization (O&A) the Federal Communications Commission (FCC) sent to National Telecommunication and Information Administration (NTIA) which would grant LightSquared a waiver of the FCC's rules in the 1525-1559 MHz band. This band is used by Federal and non-Federal Inmarsat users, is adjacent to 1559-1610 MHz used by Global Positioning Systems L1 (GPS L1), and 1435-1525 MHz used by Federal and non-Federal Aeronautical Mobile Flight Test Telemetry (AMT). The GPS L1 band is used for military, federal and all commercial applications. It is my understanding that interference to GPS, Inmarsat, and AMT operations from LightSquared's terrestrial mobile use, particularly from base stations, would likely result if the requested waiver is "conditionally granted" by FCC as it currently stands and the necessary studies are not completed and understood.

DoD is concerned with the O&A being conducted without the proper analysis required to make a well informed decision. Given the potential negative impacts to GPS, Inmarsat, and AMT operations, request NTIA advocate to the FCC to defer action on the waiver request and place this application under a Notice of Proposed Rule-Making to allow for the development of a robust public record and adequate interference analysis and mitigation options to protect GPS, Inmarsat, AMT and any other Federal operations in and adjacent to the band.

Thank you for your time regarding this matter and if you have any questions please feel free to contact me or my point of contact Mr. Kenneth Turner at 703-607-0735.

Sincerely

Danny Price
Director, Spectrum and Communication Policy