

BEFORE THE
Federal Communications Commission
 WASHINGTON, DC 20554

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JUL 10 2009

Federal Communications Commission
 Bureau / Office

In the Matter of)	
)	
Mobile Satellite Ventures Subsidiary LLC)	
)	
Application for Minor Modification of Space Station License (AMSC-1))	File No. SAT-MOD-20090429-00047
)	
Application for Minor Modification of Space Station License (MSV-1))	File No. SAT-MOD-20090429-00046
)	
Application for Modification of Blanket License to Operate Mobile Earth Terminals (MSAT-1))	File No. SES-MOD-20090429-00536
)	

To: Chief, Satellite Division

COMMENTS OF THE U.S. GPS INDUSTRY COUNCIL

The U.S. GPS Industry Council (the "Council"), through counsel, hereby comments on the above-referenced applications of SkyTerra Subsidiary LLC ("SkyTerra"), formerly Mobile Satellite Ventures Subsidiary LLC,¹ to modify its Mobile Satellite Service Ancillary Terrestrial Component ("ATC") license to allow for greater flexibility in its ATC operations (collectively "Modification Application").² The Council's comments are limited to one aspect of the Modification Application: potential additional interference from SkyTerra's significantly increased ATC operations to receivers operating with the U.S. Global Positioning System ("GPS"). While SkyTerra purports not to seek to modify its license obligation to operate ATC service within

¹ For clarity, the short-form SkyTerra will be used generally in these comments instead of MSV.

² See Public Notice, Report No. SAT-00609 (released June 5, 2009); and Public Notice, Report No. SES-0114 (released June 10, 2009).

specified out-of-band emissions (“OOBE”) limits in the radionavigation satellite service (“RNSS”) 1559-1610 MHz band,³ SkyTerra’s unlimited and ubiquitous deployment of indoor ATC picocells and femtocells will cause significant additional interference to GPS receivers.

At present, SkyTerra is required to limit its OOBE to protect RNSS.⁴ These OOBE limits are the product of technical discussions between SkyTerra and the Council, which formed part of an agreement the parties submitted to the National Telecommunications and Information Administration (“NTIA”), the co-regulator of RNSS spectrum in the United States.⁵ As noted in the Modification Application, these limits were later adopted by the Commission as a condition to SkyTerra’s ATC service.⁶ It is important to note that SkyTerra’s L-band ATC operates in the 1525-1559 MHz and the 1626.5-1645.5 MHz bands, which in effect “sandwiches” the RNSS 1559-1610 MHz band where GPS operates its L-1 signal.

The 2002 technical discussions between SkyTerra and the Council were premised on an operational scenario where there were regulatory limits on the number of ATC base stations that could be deployed, and where the contemplated use of indoor base stations was operationally very different from what SkyTerra now proposes in its Modification Application. In 2005, the Commission lifted the regulatory limit on base station deployment, effectively and significantly changing the operational scenario on which the Council premised its discussions with SkyTerra in 2002, and on which these parties based the 2002 Agreement. Furthermore, SkyTerra now proposes to deploy microcell and femtocell technology that had not been developed in 2002, and to

³ See Modification Application at 19 n.50.

⁴ See *Mobile Satellite Ventures Subsidiary, LLC*, 19 FCC Rcd 22144, 22176-179 (¶ 95) (IB 2004).

⁵ See Joint Letter from Bruce D. Jacobs, Counsel to SkyTerra (then MSV), and Raul R. Rodriguez, Counsel to the U.S. GPS Industry Council, to James Vorhies, Office of Spectrum Management, NTIA, dated July 25, 2003 (“2002 Agreement”).

⁶ See Modification Application at 19 n.50.

deploy this technology ubiquitously, indoors and outdoors, and in the hundreds of thousands of units operating in the band adjacent to the GPS L-1 signal. Essentially, these new ATC applications will be consumer products not unlike today's WiFi and similar technologies. This significantly different operating scenario causes the Council very serious concern that critical GPS receiver functions, particularly those with important public safety applications, could be seriously compromised.

To the extent that the Council contemplated potential indoor picocell development in discussions leading to the 2002 Agreement, the anticipated deployment of such units was then considered quite limited, both in overall number and in placement, *i.e.*, with expected operations limited to public spaces such as parking garages, airport lounges and/or public transportation stations. The picocells were intended to augment ATC signal strength in places where outdoor base stations could not penetrate.

The scenario that SkyTerra now proposes is dramatically different, anticipating the wide dispersal of unlimited numbers of base stations inside office buildings, college campus buildings, homes and many other indoor or outdoor locations. In addition to these changes in the operating scenario from the 2002 discussions that underpinned the 2002 Agreement, SkyTerra now also proposes to deploy indoor femtocells operating at -4dBW/MHz EIRP and to deploy microcells indoors or outdoors with an EIRP of between -4 and 10 dBW/MHz.⁷

The Council discusses below the potential interference from SkyTerra's current proposal to critical GPS receivers operating indoors, describing how SkyTerra must reduce its OOB from its indoor femtocell and microcell operations to avoid interference into RNSS receivers in their vicinity. The Commission requires GPS-enabled E911 cell phones to be able to operate indoors.

⁷ See Modification Application at 9 n.24.

In the Ultra Wideband proceeding,⁸ in order to determine the OOB limit necessary to protect GPS receivers, the Commission established a 2-meter separation distance that resulted in no more than a 1 dB rise in the GPS noise floor. This 2-meter separation distance is more appropriate in evaluating OOB from SkyTerra femtocells operating indoors in the vicinity of GPS-enabled cell phones, than the original 4.5-meter separation distance that was used in the 2002 analysis. This analysis applies even more strongly here given that SkyTerra itself has described its intended femtocell operations as akin to a WiFi router. The Commission, the Federal Agencies with GPS oversight, as well as members of industry, recognize that a six-foot [two-meter] separation distance between a GPS victim receiver and a source of interference is a reasonable assumption as well as to limit interference to a 1 dB rise in the noise floor.⁹

Because a femtocell could be present in the same room with a UWB device, the OOB limit for indoor femtocell operations must be set at -111.7 dBW/MHz for a single femtocell placed at 2 meters distance from a possible GPS receiver (+3 dBic GPS antenna gain). This, when added to the already allocated UWB emissions (-105 dBW/MHz at 2 meters), will result in a 1 dB rise in an emission-free indoor noise floor (-200 dBW/Hz at room temperature). In another scenario, a second femtocell (or PC card) could be communicating with the first femtocell. This second device, also located at a distance of 2 meters from the GPS receiver (but towards 0 dBic GPS antenna gain -3dB less than the first emitter), now would be allocated one-half of the emission budget. Thus, the first femtocell emission level must be reduced by 3 dB to -114.7 dBW/Hz to accommodate the second femtocell (or PC card) emitting at a level of -111.7 dBW/Hz.

⁸ See, e.g., *Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems*, 17 FCC Rcd 7435, 7474-75 (¶¶ 106-108) (2002).

⁹ See, e.g., Titus, DaFesh, Wong, Maine and Stansel, *Assessing Ultra Wide Band Interference to GPS Receivers*, presented to the Institute of Navigation (Fall 2002 Meeting).

For all of the foregoing reasons, the U.S. GPS Industry Council respectfully urges the FCC to condition any grant of the SkyTerra Modification Application to require adherence to the appropriate emission limitations outlined above in order to protect GPS receivers operating in the RNSS from harmful interference that would otherwise occur.

Respectfully submitted,

U.S. GPS INDUSTRY COUNCIL

By: /s/ Raul R. Rodriguez

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Its Attorneys

TECHNICAL CERTIFICATE

I, Dr. A. J. Van Dierendonck, hereby certify, under penalty of perjury, that I am familiar with Part 15 of the Commission's rules, that I am a technically qualified person, and that I have either prepared or reviewed the technical information submitted in the foregoing "Comments of the U.S. GPS Industry Council" concerning the Modification Application of SkyTerra Subsidiary LLC, and found it to be complete and accurate to the best of my knowledge and belief.

July 10, 2009

By:

A handwritten signature in black ink that reads "A. J. Van Dierendonck". The signature is written in a cursive style with a large, looped initial "A".

Dr. A. J. Van Dierendonck

CERTIFICATE OF SERVICE

I, Rebecca J. Cunningham, hereby certify that on this 10th day of July, 2009, a copy of the foregoing Comments of the U.S. GPS Industry Council is being sent via first class, U.S. Mail, postage prepaid, to the following:

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/s/ Rebecca J. Cunningham
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