



DUPLICATE

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**VIA HAND DELIVERY**

Mr. Thomas S. Tycz  
Chief, Satellite Division  
International Bureau  
Federal Communications Commission  
445 12<sup>th</sup> Street, S.W., Room 6-A665  
Washington, D.C. 20554

**Re: Application of Virtual Geosatellite L.L.C. for Authority to Launch and Operate a Global Fixed-Satellite Service System Employing Satellites in Sub-Geosynchronous Elliptical Orbits, File Nos. SAT-LOA-19980108-00007 and SAT-AMD-20020916-00173, Call Sign S2366**

Dear Mr. Tycz:

Virtual Geosatellite, L.L.C. ("Virtual Geo"), through its attorneys, hereby requests a twelve-day extension of time in order to respond to the two requests for additional information the Satellite Division made of Virtual Geo in its November 10, 2004 letter in the above-referenced application proceeding. *See* Letter dated November 10, 2004, from Thomas Tycz to David Castiel, President and Manager, Virtual Geo ("November 10 Letter"). In the November 10 Letter, the Satellite Division directed Virtual Geo to amend its application on or before December 10, 2004 to include an updated and conforming orbital debris mitigation plan and to provide, pursuant to Section 25.146(a) of the Commission's Rules, a computer program that demonstrates the proposed "Virgo" non-geostationary satellite orbit ("non-GSO") fixed-satellite service ("FSS") system's compliance with the Ku-band equivalent power flux density ("EPFD") limits in Section 25.208 of the Commission's Rules. For the reasons provided below, Virtual Geo requests an additional twelve days – or until December 22, 2004 – within which to finalize and file the required amendment.

With respect first to the orbital debris mitigation plan, Virtual Geo has used the occasion of the November 10 Letter and the elaboration earlier this year of the Commission's policy on orbital debris mitigation to revisit its 2002 plan for post-mission disposal of the spacecraft in the proposed Virgo system. It has determined that under all relevant considerations, disposal of the satellites via controlled atmospheric re-entry is the preferred method. As this marks a change from the prior proposal, and as a revised plan has had to be developed in parallel with the EPFD showing also required of Virtual Geo, there has not been



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sufficient time for work to be fully completed on the revised submission in advance of the original December 10 deadline. The brief extension Virtual Geo requests here would allow that work to be completed, and would let Virtual Geo introduce the debris-reducing approach of having its satellites re-enter the atmosphere rather than linger in orbit for centuries.

In its November 10 Letter, the Satellite Division, noting a number of developments in the Commission's rules and in Working Party 4A of the Radiocommunication Sector of the International Telecommunication Union ("ITU-R"), also called upon Virtual Geo to provide a computer program (including source codes and an executable file) based on the software specification in related ITU-R Recommendation S.1503, to enable the Commission to determine the accuracy of Virtual Geo's demonstration of the Virgo system's compliance with the EPFD limits. November 10 Letter at 2. Virtual Geo also requires an extension of the compliance deadline for this element of the November 10 Letter.

In September 2002, Virtual Geo amended its application to include a comprehensive showing of how its proposed non-GSO FSS system, using elliptical orbit satellites with active arcs that are widely separated from the geostationary satellite orbit ("GSO"), will easily meet the applicable EPFD limits contained in Section 25.208 of the Commission's Rules, 47 C.F.R. § 25.208. In the case of the Virgo system, the maximum PFD produced at the surface of the Earth, taking into account various GSO earth station off-axis angles (from a minimum of 40° for one satellite to a maximum of 120°) is used to generate the EPFD levels. The relatively straightforward analytical approach Virtual Geo used in its September 2002 analysis of compliance with the Commission's EPFD limits – an approach that showed that the maximum EPFD<sub>down</sub> and EPFD<sub>up</sub> levels produced by the Virgo system are lower than the most stringent of the respective EPFD limits given in the FCC rules and Article 22 of the ITU Radio Regulations – is much more appropriate for use with the Virgo HEO architecture than it would be in the much closer case for EPFD compliance that is found with non-GSO systems using circular low-Earth orbits. *See* Virtual Geo Application, September 2002 Amendment, File No. SAT-AMD-2002-916-00173. In the low-Earth orbit case, the complex computer algorithms contemplated by the ITU studies and the Commission's rules are clearly necessary to ensure that the EPFD levels established for the protection of GSO networks are met.

In light of this background, several factors have combined to hinder Virtual Geo's efforts at timely compliance with the EPFD element of the November 10 Letter, leading it to require a modest extension of the December 10 deadline. First, and notwithstanding the Satellite Division's letter, there is no completely satisfactory commercial computer program that is appropriate for assessing EPFD compliance by non-GSO FSS systems using highly-elliptical orbits ("HEO"). HEO systems such as Virgo are designed from the outset to minimize the production of interference into GSO FSS networks through techniques such as wide separation of the non-GSO FSS system active arcs from the GSO. The software tools referenced in the November 10 Letter as being "readily available" are not identified in the ITU literature that discusses them (*see* ITU-R Document 4A/78, Annex 13, May 2004), and the literature itself



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suggests that the tools under discussion are subject to some material shortcomings. With an extension to December 22, Virtual Geo is confident that it can build upon work done to date and create a program that accurately accomplishes the objectives set forth in Section 25.146(a) of the Commission's rules – i.e., provide a valid program that allows the Commission to determine Virgo's EPFD compliance.


Second, and as the Division may be aware, ITU-R Working Party 4A just finalized a substantial revision of Recommendation S.1503 at its October 2004 meeting, and the draft revision to the recommendation was adopted for approval by correspondence by Study Group 4 on October 22 of this year. Virtual Geo and its technical consultants are assessing the revisions to Recommendation S.1503 (despite the fact that the revision to the recommendation is not yet formally approved) in an effort to avoid having to re-amend its application again if its application remains pending when Recommendation S.1503-1 becomes effective. As the recommendation and its revisions are lengthy and complex, the extension Virtual Geo requests here is necessary to allow for the completion of this effort.

Finally, Virtual Geo and its technical consultants have run into some procedural delays attributable to questions over Virtual Geo's ability to submit proprietary software used for the assessment of EPFD compliance to the Commission. These difficulties, which remain unresolved, have led Virtual Geo to the conclusion that an alternative computer program has to be developed. Virtual Geo is developing the necessary program and is confident that work will be finished in time for Virtual Geo to file the required materials with the Commission on December 22.

In sum, Virtual Geo submits that good cause exists for the grant by the Division of an extension until December 22, 2004 of the deadline for compliance with the November 10 Letter.

Please contact the undersigned if there are any questions regarding this matter.

Respectfully submitted,



Raul R. Rodriguez  
Stephen D. Baruch

cc: Ms. Fern Jarmulnek (by email)  
Mr. Mark Young (by email)  
Mr. Kal Krauktkramer (by email)  
Mr. Sankar Persaud (by email)