



Federal Communications Commission
Washington, D.C. 20554

March 23, 2011

Brian D. Weimer
Sheppard Mullin Richter & Hampton
1300 I Street, N.W.
Washington, D.C. 20005-3314

Re: O3b Limited
IBFS File No. SES-LIC-20100723-00952
(Call Sign: E100088)

Dear Mr. Weimer:

On July 23, 2010, O3b Limited (O3b) filed the above-referenced application for authority to construct and operate a Ka-band fixed-satellite service (FSS) telemetry, tracking, telecommand, and gateway earth station in Haleiwa, Hawaii. O3b plans to use the earth station to communicate with a non-U.S. licensed, non-geostationary orbit (NGSO) FSS network to be operated by O3b through an authorization from the United Kingdom.¹

Pursuant to Section 25.111(a) of the Commission's rules, the Satellite Division requests O3b to amend its application to include the following information:

1. O3b seeks a waiver of the space station cross-polarization isolation requirement set forth in Section 25.210(i) (1) of the Commission's rules to operate with a cross-polarization isolation of 18.5 dB, rather than the required 30 dB. In this regard, O3b states "the co-polar transmissions . . . will dictate the interference levels to and from other networks and systems, and not the level of cross-polar radiation in the O3b system."² The link budget and interference analysis submitted by O3b lacks support for this claim. Accordingly, we request O3b to further substantiate its claim.
2. Article 22.5I of the ITU Radio Regulations requires NGSO networks to meet the effective power flux density (EPFD) limits specified in Articles 22.5C (EPFD ↓), 22.5D (EPFD ↑), and 22.5F (EPFD_{is}) in order for an NGSO system to be fully coordinated with geostationary satellite orbit (GSO) systems under Article 22.2. O3b provides, in its interference analysis, a showing that it complies with Articles 22.5C (for the 17.8-18.6 GHz frequency band), 22.5D (for the 27.5-28.6 GHz frequency band) and 22.5I. However, O3b has not provided a showing relating to compliance with Article 22.5F (for the 17.8-18.4 GHz frequency band). Consequently, we request O3b to provide the Article 22.5F EPFD_{is} analysis.

¹ IBFS File No. SES-LIC-20100723-00952, U.S. Market Application at 2.

² *Id.* at 23.

3. To demonstrate that the EPFD limits calculated for its NGSO system satisfy the requirements of Article 22 of the ITU Radio Regulations, O3b performed a time-domain simulation of the O3b system to determine whether the satellites conform to relevant Article 22 EPFD limits/masks. O3b provides a narrative summary of the results of its software simulation, but did not provide a copy of the software or the software's supporting documentation. Pursuant to ITU Radio Regulations, this information must be filed by O3b's notifying administration with the ITU. We request O3b to submit to the Commission a copy of the simulation software developed in accordance with ITU-R Recommendation S.1503-1 (04/05) and supporting documentation.
4. O3b requests a waiver of the requirement in Section 25.283(c) of the Commission's rules that all stored energy sources on board the satellite be discharged at end of life by venting excess propellant, discharging batteries, relieving pressure vessels, and other appropriate measures. O3b notes that a small amount of pressurant will remain (about 100 psia) that cannot be vented. We request that O3B provide the following information:
 - a) The type of pressurant;
 - b) The type of propellant to be used;
 - c) The mass and volume of remaining propellant at end-of-life (if any);
 - d) The volume of the tank;
 - e) A diagram of the tank with dimensions, indicating the location of the diaphragm in the tank at end-of-life;
 - f) The worst-case change in satellite velocity that could result from perforation of the propellant tank at end-of-life and the method used to calculate this;
 - g) Analysis of whether post-mission rupture of the diaphragm following normal completion of mission could under any circumstances result in repressurization of some part of the propulsion system;
 - h) Your technical exhibit states, at p.35, that all of the remaining propellant will be vented from the tank at end-of-life. Please explain how this will be accomplished, and indicate whether the interior of the tank will effectively be open to space once the satellite is retired.
5. Although O3b provides predicted space station antenna beam contours, in accordance with Section 25.114(d)(3) of the Commission's rules, the antenna beam contour diagrams provided in Schedule S contain confusing labels. O3b did not include a title block with its beam information (*i.e.* beam ID, polarization, antenna gain, *etc.*) or latitude/longitude information on the contour diagrams. In addition, the antenna beam contour diagrams provided in the narrative of the application differ slightly from the contour diagrams provided in Schedule S. We ask O3b to review the predicted space station antenna beam contour information provided in both its narrative and Schedule S for consistency. We further request O3b to provide improved labels for the antenna beam contour diagrams in Schedule S.

6. In response to question E16 on Schedule B, O3b indicates that the proposed 7.3 meter antenna complies with the antenna gain patterns specified in Section 25.209(a)(2) and (b), as demonstrated by the manufacturer's qualification measurements. We ask O3b to provide manufacturer's qualification measurements and/or certified measurements of the antenna's performance. In doing so, O3b should ensure that the submissions establish that the antenna gain patterns demonstrate performance within the off axis limits of Section 25.209(a)(2) and (b) and Article 22.5D (EPFD \uparrow) as O3b's NGSO space stations pass from horizon to horizon when communicating with the proposed earth station location.
7. We ask O3b to provide the following earth station information for all uplink bands requested in its application:
 - a) A set of NGSO FSS earth station maximum equivalent isotropically radiated power (EIRP) masks as a function of the off-axis angle generated by O3b's proposed NGSO FSS earth station antennas. In particular, the calculations should encompass what would be radiated regardless of the earth station transmitter power resource allocation and traffic/beam switching strategy that are used at different periods of the NGSO FSS system life. The EIRP masks must be in an electronic form that can be accessed by the computer program referenced in subparagraph (c) below;
 - b) A detailed description of the assumptions and conditions used in generating the maximum earth station EIRP mask;
 - c) The single-entry EPFD \uparrow validation limits derived using software developed in accordance with ITU-R Recommendation S.1503-1 (04/05). Please provide the program name and version used if publicly available, or the executable file for the software program if not publicly available;
 - d) The input parameters necessary to run for the execution of the computer program identified in paragraph (c) above;
 - e) The result of the computer program described above.
8. Section 25.203(g)(1) of the Commission's rules states that applicants proposing to operate new transmitting facilities are advised to consider the effect of the operations on Commission monitoring stations. The Commission's monitoring station at Waipahu, Hawaii (21°22'33.6" N. Latitude, 157°59'44.1" W. Longitude) is 33 kilometers from O3b's proposed site. Please submit a field strength analysis that demonstrates the earth station will operate within the limits defined by Section 25.203(g)(1).
9. We ask O3b to correct minor discrepancies in the coordination data sent to terrestrial stations and the data contained in the Form 312. In particular, in item E36 of Schedule B

(antenna height above sea level), O3b lists 147.97 meters. In its Technical Information Supplement (Exhibit 1 to Appendix B of Attachment A to the Technical Information Supplement at 2), O3b lists 137.77 meters. In addition, on page 2 of Exhibit 1 to Appendix B of Attachment A to the Technical Information Supplement Schedules, O3b indicates it has coordinated emission bandwidths of up to 720 MHz in frequency bands that only contain 216 MHz of bandwidth. Please correct any discrepancies and indicate whether these corrections will have any impact to the coordination report.

We request O3b Limited to respond to this letter by April 23, 2011. Failure to do so may result in the dismissal of O3b's pending application pursuant to Section 24.112(c) of the Commission's rules.

Sincerely,

A handwritten signature in black ink, appearing to read 'R. Nelson', with a long horizontal flourish extending to the right.

Robert G. Nelson
Chief, Satellite Division
International Bureau