



Federal Communications Commission  
Washington, D.C. 20554

September 25, 2013

Joslyn Read  
Vice President, Regulatory Affairs  
O3b Limited  
1129 20<sup>th</sup> St., NW, Suite 1000  
Washington, D.C. 20036

Re: O3b Limited  
IBFS File No. SES-LIC-20130528-00455  
Call Sign: E130098

Dear Ms. Read:

This letter requests additional information regarding O3b Limited's above-referenced application for authority to operate earth stations aboard maritime vessels that will communicate with O3b's Ka-band non-geostationary satellite orbit (NGSO) Fixed-Satellite Service (FSS) system licensed by the United Kingdom (Blanket Application). In particular, O3b requests a blanket license to operate up to 100 earth stations with 2.2-meter antennas and up to 100 earth stations with 1.2-meter antennas on U.S.-registered vessels that will operate in U.S. territorial waters, international waters, and foreign waters. O3b indicates that the earth stations will transmit in the 28.6-29.1 GHz frequency band and receive in the 18.8-19.3 GHz frequency band. O3b proposes to operate on a non-conforming basis when the vessels are in motion, and on a primary basis when the vessels are stationary. O3b's Blanket Application also includes a discussion of the regulatory framework under which it will operate on non-U.S.-registered vessels in waters adjacent to the U.S. Coast.<sup>1</sup>

The Commission previously authorized O3b to operate two FSS earth stations to communicate with O3b's NGSO FSS Ka-band system. The first authorization was for a fixed earth station in Haleiwa, Hawaii and the second authorization was for a fixed earth station in Vernon, Texas.<sup>2</sup> Both fixed earth stations use 7.3-meter antennas to continuously track visible in-orbit O3b satellites, with the Haleiwa, Hawaii earth station providing gateway and telemetry, tracking and command (TT&C) services and the Vernon, Texas earth station providing gateway and back-up TT&C services. In the Hawaii and Texas applications, O3b explained that to the extent it sold its services to customers in the United States, an

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<sup>1</sup> Blanket Application, Narrative at 6-7, Section entitled "O3b's Application is Consistent with the Regulatory Regime the Commission Adopted for C-band and Ku-band ESVs on Foreign-flagged Ships."

<sup>2</sup> O3b Limited, IBFS File No. SES-LIC-20130124-00089 (Vernon, Texas, Call Sign E130021), granted June 20, 2013 and IBFS File No. SES-LIC-20100723-00952 (Haleiwa, Hawaii, Call Sign E100088), granted Sept. 25, 2012.

application for authority to operate such earth stations would be filed.<sup>3</sup> As a result, the technical waivers and legal issues addressed by the gateway authorizations were limited to the proposed gateway and TT&C services.<sup>4</sup>

O3b's Blanket Application represents its first request to provide services to consumers in the United States. Although the information on file with respect to the Haleiwa, Hawaii and Vernon, Texas earth stations is useful in understanding O3b's NGSO constellation, to facilitate processing of O3b's Blanket Application, we request, pursuant to Section 25.111(a) of the Commission's rules, that O3b amend the application to include the following information:

1. O3b states that it intends to provide fiber-quality satellite broadband service to maritime passengers and crew.<sup>5</sup> Please clarify whether the services O3b intends to provide include services not covered by the United States commitments under the World Trade Organization (WTO) Agreement on Basic Telecommunications Services.<sup>6</sup> If O3b intends to provide non-covered services, please specify the countries in which satellite transmissions to O3b's system will originate or terminate (route markets). With respect to each route market, please indicate whether there are effective competitive opportunities for U.S.-licensed satellites to provide analogous services.
2. O3b seeks a waiver of Section 25.145(c) of the Commission's rules, which requires Ka-band NGSO FSS systems to be capable of: (1) serving locations as far north as 70 degrees latitude and as far south as 55 degrees latitude for at least 75 percent of every 24-hour period; and (2) providing FSS on a continuous basis throughout the 50 states, Puerto Rico and the U.S. Virgin Islands.<sup>7</sup> Please indicate whether O3b intends to provide other consumer services in the United States besides the services proposed in its Blanket Application.
3. Sections 25.137(c) and 25.157 of the Commission's rules require the Commission to process applications for NGSO-like systems under a "modified processing round" framework, which

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<sup>3</sup> Haleiwa, Hawaii Application, Narrative at 5.

<sup>4</sup> Both authorizations were processed as fixed gateway applications and were expressly limited to such services. Haleiwa, Hawaii Authorization, condition 90033 ("This authorization is limited to earth station call sign E100088, and does not permit O3b space stations to operate with any other earth station in the United States"); Haleiwa, Hawaii Authorization and Vernon, Texas Authorization, condition 90044 ("Because this authorization is limited to a single earth station that is providing gateway and TT&C services only, O3b is granted a limited waiver of Section 25.145(c)..."); and Vernon, Texas Authorization, condition 90089 ("This authorization is limited to earth station call sign E130021, and does not permit O3b space stations to operate with any other earth station in the United States.").

<sup>5</sup> In its Hawaii application to provide gateway and TT&C services, O3b indicated that it did not seek to provide Direct-to-Home (DTH), Digital Audio Radio Service (DARS), or Direct Broadcast Satellite (DBS) Service in the United States. Haleiwa, Hawaii Application, Narrative at 11, note 24. O3b did not include a similar statement in its Blanket Application, although the broadband consumer services requested are different from gateway and TT&C services in the Hawaii application.

<sup>6</sup> Non-covered services under the WTO Basic Telecom agreement are DTH, DBS, and DARS. *See Amendment of the Commission's Regulatory Policies to Allow Non-U.S. Licensed Space Stations to Provide Domestic and International Satellite Service in the United States*, Report and Order, 12 FCC Rcd 24094, 24099-24100 (1997).

<sup>7</sup> *Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed-Satellite Services*, Third Report and Order, 12 FCC Rcd 22310, 22323 (1997); and 47 C.F.R. § 25.145(c).

divides spectrum among competing applicants. O3b sought, and was granted, a waiver of these provisions in its Haleiwa, Hawaii earth station authorization. O3b incorporates this waiver showing by reference in the Blanket Application. In the Hawaii application, O3b described the technical aspects of its system that would allow for subsequent entry of additional NGSO FSS Ka-band systems. At the same time, O3b explained that, in certain limited situations, some of its interference avoidance techniques would not work. For example, O3b explained that when an earth station is operating at the highest latitudes of O3b's service area, it might be unable to switch target satellites to avoid interference and would need to rely upon other techniques to avoid interference with additional NGSO FSS Ka-band systems.<sup>8</sup> Please confirm that the services O3b requests authority to provide in its Blanket Application will not preclude the operation of another NGSO FSS system operating in the same frequency bands. Please also confirm that the technical showing provided in the Haleiwa, Hawaii application to support the waiver of Sections 25.137(c) and 25.157 of the Commission's rules remains accurate, taking into consideration the new services and service areas proposed in the Blanket Application. To the extent O3b's rationale for waiver is modified or changed as a result of the new services requested in this application, O3b should provide an amended rationale, together with an associated technical showing.

4. O3b indicates that it intends to provide fiber quality satellite broadband service to maritime passengers and crew. In the *CALEA First Report and Order*, the Commission concluded that the Communications Assistance for Law Enforcement Act (CALEA)<sup>9</sup> applies to facilities-based broadband Internet access providers and providers of interconnected voice over Internet Protocol (VoIP) service.<sup>10</sup> To the extent O3b will provide services within the scope of CALEA, O3b should explain the steps taken to ensure compliance with CALEA.
5. O3b requests a waiver of the Ka-band Plan and the U.S. Table of Allocations for the purposes of providing its services aboard U.S.-registered maritime vessels. O3b also discusses operations aboard non-U.S.-registered vessels in U.S. territorial waters in its application. To the extent that O3b also intends to provide services aboard non-U.S. registered vessels, please confirm that O3b also seeks a waiver of the Ka-band Plan and U.S. Table of Allocations, as well as any other applicable operational rules, with respect to operations by non-U.S. registered vessels in waters adjacent to the U.S. coast.
6. O3b incorporates by reference the Schedule S submitted in its Hawaii application (Hawaii Schedule S). The Hawaii Schedule S contains different power flux density (pfd) limits and service areas than those proposed in O3b's Blanket Application. For example, the Hawaii Schedule S does not reflect the Vernon, Texas gateway earth station. It also does not include pfd limits for the proposed maritime services or the applicable technical parameters for all earth station antenna types with which O3b intends to operate in the United States (*i.e.*, 7.3-meter, 2.4-meter, 2.2-meter, and 1.2-meter antennas). Please provide a new Schedule S for O3b's system

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<sup>8</sup> Haleiwa, Hawaii Narrative at 9.

<sup>9</sup> Pub. L. No. 103-414, 108 Stat. 4279 (1994) (codified as amended in sections of 18 U.S.C. and 47 U.S.C.); *Communications Assistance for Law Enforcement Act and Broadband Access and Services*, ET Docket No. 04-295, Notice of Proposed Rulemaking and Declaratory Ruling, 19 FCC Rcd 15676 (2004) (*CALEA Notice*).

<sup>10</sup> See *Communications Assistance for Law Enforcement Act and Broadband Access and Services*, ET Docket No. 04-295, FCC 05-153, First Report and Order and Further Notice of Proposed Rulemaking, 20 FCC Rcd 14989, 15001 at ¶ 24 (2005).

that accurately represents all services O3b intends to provide in its Blanket Application.

7. Please clarify the service area description and service area diagram in the Blanket Application.<sup>11</sup> In the service area description, O3b specifies the service area as “the coastal regions of CONUS.” The service area diagram shows the service area as encompassing the entire CONUS. Please provide an updated service area diagram that includes only those areas where the U.S.-registered maritime vessels will operate in U.S. territorial waters, international waters, and foreign waters.
8. O3b provides link budgets for gateway service from Peru. Please clarify the basis for including this link budget. In addition, please provide link budgets for operations requested in the Blanket Application, including, if applicable, operations of any non-U.S.-registered maritime vessels in U.S. territorial waters.
9. In Annex 5 of the Blanket Application, O3b appears to have supplied duplicative information on pages 31 and 32. Please provide the link budget for the return link that corresponds to the forward link for which the link budget is provided on page 31.<sup>12</sup>
10. Please provide the measured antenna performance data for the 1.2-meter and 2.2-meter antennas.<sup>13</sup> For each earth station antenna size, provide a series of radiation pattern measurements of production antennas that are performed on a calibrated antenna range. To facilitate processing, we request O3b to provide pattern measurements at the bottom, middle, and top frequencies of the 30 GHz band, as described in Section 25.138(d) of the Commission's rules applicable to GSO FSS earth stations.
11. Please provide either the space station nadir-pointing antenna pattern contour diagrams for the user and gateway antenna beams or a mathematical description of the antenna beams necessary to derive the antenna pattern contour diagram for any O3b satellite location and earth station location.
12. Please provide a map showing how many space station antenna beams may operate in the United States at the same time. If there is a situation where multiple co-frequency emissions from the same satellite will use overlapping beams, please describe the overlap in detail, including how many of these beams can overlap within the -3dB contour of each beam at the same location in the United States.
13. Please describe how the 1.2-meter and 2.2-meter antennas will be installed and isolated on maritime vessels to mitigate radiation hazards to personnel in both controlled and uncontrolled environments in the near, transition, and far field regions.

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<sup>11</sup> O3b Limited, IBFS File No. SES-LIC-20130528-00455, Attachment A at 2, and Attachment A, Figure A.3-1 at 3.

<sup>12</sup> *Blanket Application*, Annex 5 at 31-32.

<sup>13</sup> *Blanket Application*, Annex 1 at A2-3 and A2-5.

Please submit the requested information by October 25, 2013. Failure to do so may result in the dismissal of O3b's pending application pursuant to Section 25.112(c) of the Commission's rules, 47 C.F.R. § 25.112(c).

Sincerely,

  
Jose Albuquerque  
Chief, Satellite Division  
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