

REQUEST FOR LIMITED WAIVER OF THE COMMISSION'S REQUIREMENTS

O3b Limited ("O3b") hereby requests a limited waiver of the Commission's requirements, to the extent needed and on the terms described below, to conduct tests and demonstrations, and to provide commercial service, using Ka-band maritime earth stations on up to thirty additional foreign-flagged ships (the "Thirty-Ship Waiver Request"). The maritime earth stations will communicate with O3b's non-geostationary satellite orbit ("NGSO") Fixed-Satellite Service ("FSS") system.¹ To ensure timely initiation of service, O3b asks that the waiver be granted no later than December 31, 2015.

O3b has already received approval from the Commission for other maritime earth station operations:

- O3b was granted a license to operate up to one hundred 1.2m and one hundred 2.2m maritime earth stations on U.S.-flagged ships in O3b's NGSO-primary channels 4 and 5 (*i.e.*, 28.6-29.1 GHz uplink and 18.8-19.3 GHz downlink) (the "Blanket Maritime License").²
- O3b was granted a waiver allowing 1.2m and 2.2m maritime earth stations to use O3b's NGSO-primary channels 4 and 5 (*i.e.*, 28.6-29.1 GHz uplink and 18.8-19.3 GHz downlink) on foreign-flagged ships in and near U.S. waters (the "Blanket Maritime Waiver").^{3 4}
- O3b was granted a waiver to operate 2.2m maritime earth stations on up to three foreign-flagged ships in the Geostationary Orbit ("GSO")-primary portion of O3b's channel 3 (*i.e.*, 28.35-28.4 GHz uplink and 18.3-18.6 GHz downlink) (the "Three-Ship Waiver").⁵

¹ In September 2012, the Commission granted O3b a license to operate one of the gateways for this system in Haleiwa, Hawaii. See FCC File No. SES-LIC-20100723-00952 (granted Sep. 25, 2012). In June 2013, the Commission granted O3b a license to operate a second gateway, which is located in Vernon, Texas. See FCC File No. SES-LIC-20130124-00089 (granted June 20, 2013). The Commission has consolidated O3b's U.S. market access for its 12-satellite constellation under a single authorization. See O3b Limited, Call Sign S2935, File No. SAT-LOI-20141029-00118 (granted Jan. 22, 2015) ("O3b PDR").

² See O3b Blanket Maritime Application, File No. SES-LIC-20130528-00455 (granted May 13, 2014). As used in this filing, the term "ships" includes all types of vessels that maritime earth stations are permitted to serve.

³ Letter from Jose Albuquerque, Chief, Satellite Division and Mark Settle, Chief, Policy and Rules Division, to Joslyn Read, O3b Limited, DA 14-637 (rel. May 13, 2014).

⁴ O3b also was granted a six-month waiver to conduct tests and demonstrations using maritime earth stations on two foreign-flagged ships operated by Royal Caribbean when the ships are in or near U.S. waters (the "Six-Month Waiver"). Letter from Jose Albuquerque, Chief, Satellite Division and Mark Settle, Chief, Policy and Rules Division, to Joslyn Read, O3b Limited, DA 14-64 (rel. Jan. 22, 2014). This waiver is expired and has been superseded by the more comprehensive Blanket Maritime Waiver.

⁵ O3b's Three-Ship Waiver Request, FCC File No. SES-MS-20140318-00150 (granted Sep. 22, 2014).

- O3b was granted a waiver to operate 2.2m maritime earth stations on up to six foreign flagged ships in the LMDS and FS primary portion of O3b channels 1-3 (*i.e.* 27.6-28.35 GHz uplink and 17.8-18.3 GHz downlink) (“The Six-Ship Waiver”).⁶

In this Thirty-Ship Waiver Request, O3b is requesting a waiver to conduct tests and provide service on up to thirty foreign-flagged ships whose routes include ports along the U.S. east coast and in the Gulf of Mexico, in order to serve the U.S. east coast and the Caribbean region. The waiver will cover operations in or near U.S. waters (i) along the U.S. east coast as far north as Maine and as far south as Florida, (ii) in the Gulf of Mexico, and (iii) surrounding Puerto Rico and the U.S. Virgin Islands. The proposed operations involve frequencies that are not covered by the Blanket Maritime Waiver and include additional ships, because of an increase in demand, beyond those authorized by the Three-Ship Waiver and the Six-ship Waiver. By granting this waiver, the Commission will facilitate the expansion of offshore broadband internet services to maritime operations.

This waiver request includes (i) frequency bands that may be used by LMDS systems on a primary basis and by FSS systems, including NGSO FSS systems such as O3b’s, on a secondary basis (*i.e.*, the 27.6-28.35 GHz uplink band); (ii) frequency bands that may be used by FS stations on a primary basis and in which NGSO FSS systems are non-conforming (*i.e.*, the 17.8-18.3 GHz downlink band); (iii) frequency bands that may be used by GSO FSS systems on a primary basis and in which NGSO FSS systems are secondary (*i.e.*, the 28.35-28.4 GHz uplink band); and (iv) frequency bands that may be used by GSO FSS systems on a primary basis and in which NGSO FSS systems are nonconforming (*i.e.*, the 18.3-18.6 GHz downlink band). O3b demonstrates herein that it satisfies the FCC’s waiver criteria because it will provide the requisite level of protection for services authorized by the Commission and it will accept interference from services authorized by the Commission.

I. Introduction

For statutory reasons, the Commission does not license maritime earth stations, including earth stations on vessels (“ESVs”) that transmit from foreign-flagged ships.⁷ The Commission requires, however, that maritime earth stations on foreign-flagged ships not cause harmful interference to FCC-licensed radio stations when the foreign-flagged ships are located in U.S. waters.⁸ In keeping with this requirement, O3b

⁶ O3b’s Six-Ship Waiver Request, FCC File No. SES-MS-20150206-00066 (granted May 20, 2015).

⁷ “Section 306 of the Communications Act provides that the Commission does not have the authority to license radio stations, such as ESVs, on vessels registered by foreign administrations (foreign-registered vessels).” *In the Matter of Procedures to Govern the Use of Satellite Earth Stations on Board Vessels in the 5925-6425 MHz/3700-4200 MHz Bands and 14.0-14.5 GHz/11.7-12.2 GHz Bands*, 20 FCC Rcd 674, ¶ 122 (2004) (footnote omitted)(“*ESV R&O*”).

⁸ *Id.*, ¶¶ 122-126.

demonstrated in its requests for the Blanket Maritime Waiver, the Three-Ship Waiver, and the Six-Ship Waiver that its maritime earth stations on foreign-flagged ships, like its maritime earth stations on U.S.-flagged ships, will protect other stations.⁹

This waiver request concerns 2.2m maritime earth stations on up to thirty foreign-flagged ships. Beginning in January of 2016, O3b intends to engage in tests and demonstrations of maritime earth stations (the “Tests”), and to provide commercial maritime service on up to thirty ships (the “Service”). Each ship will have up to three maritime earth stations.

For a portion of the time that the Tests are conducted and the Service is provided, the ships will be located in or near U.S. waters along the U.S. east coast, in the Gulf of Mexico, and surrounding Puerto Rico and the U.S. Virgin Islands. O3b is not seeking an FCC license or special temporary authorization for these operations because, as discussed above, the Commission does not issue such authorizations for maritime earth stations that are located on foreign-flagged ships. O3b, however, arguably requires a waiver of certain Commission requirements in order for the Tests and Service to be located in or near U.S. territorial waters. Out of an abundance of caution, therefore, O3b hereby requests waivers covering operations in or near U.S. waters along the U.S. east coast, in the Gulf of Mexico, and surrounding Puerto Rico and the U.S. Virgin Islands.

The waivers concern the Commission’s allocation for the frequencies that will be used in connection with O3b’s Tests and Service in or near U.S. territorial waters. During the Tests and Service, O3b’s maritime earth stations will transmit on frequencies in the 27.6-28.4 GHz band and will receive on frequencies in the 17.8-18.6 GHz band. The Commission’s Table of Allocations and Ka-band frequency plan provide that: (i) in the 27.6-28.35 GHz uplink band, local multipoint distribution service (“LMDS”) systems are primary and FSS systems are secondary; (ii) in the 28.35-28.4 GHz uplink band, GSO FSS systems are primary and NGSO FSS systems are secondary; (iii) in the 17.8-18.3 GHz band, Fixed Service (“FS”) systems are primary and NGSO FSS systems are non-conforming; and (iv) in the 18.3-18.6 GHz band, GSO FSS systems are primary and NGSO FSS systems are non-conforming.¹⁰ The table and frequency plan make no provision for using NGSO FSS systems to communicate in these bands with maritime earth stations.

⁹ Blanket Maritime Application, Narrative, Sections II.E and II.F. *See also* Three-Ship Waiver Request, FCC File No. SES-MS-20140318-00150, at 4; Six-Ship Waiver Request, FCC File No. SES-MS-20150206-00066, at 4.

¹⁰ *In the Matter of 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*, 11 FCC Rcd. 19005, ¶¶57-58 and 78 (1996). *See also In the Matter of Redesignation of the 17.7-19.7 GHz Frequency Band, Blanket Licensing of Satellite Earth Stations in the 17.7-20.2 GHz and 27.5-30.0 GHz Frequency Bands, and the Allocation of Additional Spectrum in the 17.3-17.8 GHz and 24.75-25.25 GHz Frequency Bands for Broadcast Satellite-Service Use*, 15 FCC Rcd 13430, ¶¶ 28 and 34 (2000).

To the extent necessary, therefore, O3b requests a waiver of the Table of Allocations and the Ka-band frequency plan. The waiver would permit O3b's NGSO FSS system to communicate with maritime earth stations on up to thirty foreign-flagged ships so that O3b can conduct the Tests and provide the Service when the ships are located in or near U.S. waters along the U.S. east coast, in the Gulf of Mexico, and surrounding Puerto Rico and the U.S. Virgin Islands.

The Tests and Service will take place initially on the *Freedom of the Seas*, a Bahamas-flagged cruise ship operated by Royal Caribbean. There may be Tests and Service on up to twenty-nine additional ships. The Utilities Regulation and Competition Authority of the Bahamas is one of the administrations responsible for authorizing O3b to operate its maritime earth stations on these ships, and O3b will not commence the Tests or the Service on any ship until authority has been obtained from the appropriate administration.

II. O3b Satisfies the Commission's Waiver Criteria

In its orders granting the Three-Ship Waiver and the Six-Ship Waiver, the International Bureau articulated the interference criteria the Commission applies to waiver requests associated with operating Ka-band maritime earth stations in or near U.S. waters. The Bureau stated that the Commission will grant waivers such as these "when there is little potential for interference into any service authorized under the Table of Frequency Allocations and when the non-conforming operator accepts any interference from authorized services."¹¹

O3b's waiver request satisfies these interference criteria. For purposes of the Thirty-Ship Waiver Request, O3b agrees to accept interference from services authorized by the Commission. As demonstrated in the attached Technical Statement, moreover, the operations covered by the Thirty-Ship Waiver Request will not cause interference into any service authorized under the Table of Frequency Allocations. (O3b also shows, in Annex 3 of the Technical Statement, that the operations covered by the Thirty-Ship Waiver Request are consistent with the Commission's RF radiation limits.)

Avoidance of interference to GSO FSS systems.

In the frequencies for which O3b seeks a waiver in this Thirty-Ship Waiver Request, there are both primary allocations (28.35-28.4 GHz uplink and 18.3-18.6 GHz downlink) and secondary allocations (27.6-28.35 GHz) for FSS system operations. Article

¹¹ Letter from Jose Albuquerque, Chief, Satellite Division and Mark Settle, Chief, Policy and Rules Division, to Suzanne Malloy, O3b Limited, DA 14-1369 (rel. September 22, 2014); Letter from Jose Albuquerque, Chief, Satellite Division and Mark Settle, Chief, Policy and Rules Division, to Suzanne Malloy, O3b Limited, DA 15-601 (rel. May 20, 2015).

22 of the ITU Radio Regulations sets forth standards for interference protection of GSO satellite networks from NGSO satellite systems. These standards are in the form of Equivalent Power Flux Density (“EPFD”) limits for downlink transmissions from NGSO satellite systems (No. 22.5C) and EPFD limits for uplink transmissions from NGSO satellite systems (No. 22.5D).¹²

O3b demonstrates in the Technical Statement that the operations covered by the Thirty-Ship Waiver Request comply with these EPFD uplink and downlink limits.¹³ Accordingly, the operations covered by the Thirty-Ship Waiver Request will provide the requisite level of protection for GSO FSS systems operating in the requested frequencies. O3b also shows that the earth station antenna patterns for O3b’s Thirty-Ship Waiver Request uplink transmissions conform to the antenna performance mask specified in Sections 25.209(a) and (b) of the Commission’s rules.

Avoidance of interference to Fixed Service (*i.e.*, terrestrial) stations.

As discussed below, O3b is able to avoid harmful interference to FS stations in the frequencies for which O3b herein seeks a waiver. O3b also has included in the attached Technical Statement a showing relating to FS stations that are located outside the United States.

27.6-28.35 GHz – Secondary uplink band shared with primary LMDS.

The 27.6-28.35 GHz uplink band is allocated to the LMDS on a primary basis. FSS operations are allocated on a secondary basis in the same band. Accordingly, O3b’s proposed operations in this band must not cause harmful interference to primary LMDS stations.

The Commission has previously requested information from O3b regarding O3b’s use of the 27.6-28.35 GHz frequencies,¹⁴ and O3b again addresses this matter in this Thirty-Ship Waiver Request.

The Commission has indicated that FSS operations in these bands are limited to gateway-like operations. As O3b previously stated, the Commission’s references to “gateway-type service” in the 27.5-28.35 GHz band are not intended as a requirement that earth stations in the band serve as gateway earth stations. Rather, the references to “gateway-type service” in the 27.5-28.35 GHz band reflect the Commission’s expectation as to the type of services that FSS operators would be able to provide on a

¹² The Commission has held that compliance with the ITU’s EPFD limits provides a sufficient basis for an NGSO FSS system to operate on a noninterference basis in a band in which GSO FSS systems are primary. *See contactMEO Communications, LLC*, 21 FCC Rcd 4035, 4043-4044 (IB 2006).

¹³ Technical Statement, Section A.7 at 6-13.

¹⁴ *See* O3b Bristow License Application, FCC File No. SES-LIC-20130618-00516, Letter from Joslyn Read to Marlene H. Dortch (Nov. 22, 2013).

secondary basis, *i.e.*, services the FSS operators can provide without causing interference to LMDS stations that are primary in the 27.5-28.35 GHz band.¹⁵ There is no requirement that earth stations serve as gateways. The Commission's rules support the above interpretation. Although the rules limit operations in some bands to gateway earth stations, the 27.5-28.35 GHz band is not among them.

The Commission's gateway-type service expectation relates to its understanding of the type of services that FSS operators would be able to provide. The Commission's findings in the Ka-band rulemaking proceeding shed light upon what qualifies as a gateway-type earth station that an FSS licensee may operate in the 27.5-28.35 GHz band. These findings show that the Commission's concern is with ubiquitous user terminals that could interfere with LMDS operations. The Commission stated, for example, that: "Gateways are earth stations generally larger than user terminals that support multiple carriers. ... By their nature, they are not deployed in the same ubiquitous way as the user transceivers."¹⁶ Similarly, the Commission stated in the Third Report and Order that: "As a practical matter, it is unlikely that FSS can operate ubiquitous terminals on an unprotected non-interference basis to LMDS."¹⁷

O3b's proposed operations satisfy these standards. O3b only seeks authority to operate the Thirty-Ship Waiver service in waters along the U.S. east coast, in the Gulf of Mexico and surrounding Puerto Rico and the U.S. Virgin Islands. O3b's Thirty-Ship Waiver service, therefore, is consistent with the views expressed by the Commission as to what qualifies as gateway-like.

The attached Comsearch coordination reports demonstrate that O3b can operate its maritime earth station terminals on a secondary basis in this band along the U.S. east coast, in the Gulf of Mexico, and surrounding Puerto Rico and the U.S. Virgin Islands without causing harmful interference to LMDS licensees. Comsearch sent a

¹⁵ *Id.*

¹⁶ *In the Matter of 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 and Suite 12 Group Petition for Pioneer's Preference*, Third Notice of Proposed Rulemaking and Supplemental Tentative Decision, 11 FCC Rcd 53, 60, n. 8 (1995).

¹⁷ *In the Matter of 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, 22327, ¶42 (1997). Notwithstanding its concern with ubiquitous user terminals, moreover, the Commission authorized Teledesic to provide services in the 27.5-28.35 GHz band that had ubiquitous elements. In 1997, the Commission authorized Teledesic to operate 27.5-28.35 GHz band NGSO FSS "Gigalink" terminals on a secondary basis that were to be used, among other things, "in privately owned networks and as high-rate terminals." *In the Matter of Teledesic Corporation Application for Authority to Construct, Launch, and Operate a Low Earth Orbit Satellite System in the Domestic and International Fixed Satellite Service*, Order and Authorization, 12 FCC Rcd. 3154 at ¶2156, n.6 (Chief IB 1997).

coordination notice to all existing and proposed terrestrial licensees in the band that are within applicable coordination distances.

Only one response was received from any of the incumbent licensees. O3b is coordinating with this licensee to ensure that its operations suffer no harmful interference as a result of O3b maritime operations. Once coordination with this operator is complete, which is expected imminently, O3b will file the outstanding Comsearch reports with the Commission. This is consistent with the Commission's rules as O3b expects to complete coordination shortly after submitting this application.

Further, as discussed in the Technical Statement, O3b has procedures in place for addressing 27.6-28.35 GHz band FS stations in countries that are within 100 km of its maritime earth stations.¹⁸ O3b already has implemented these procedures successfully for its maritime earth stations that are operating in accordance with the terms of the grant of the Blanket Maritime License, the Three-Ship Waiver, and the Six-Ship Waiver.¹⁹

17.8-18.3 GHz – Primary downlink band for licensed FS Systems.

This frequency band is allocated on a primary basis to FS, and there is no secondary allocation for NGSO FSS in the band. Accordingly, O3b requests a waiver of the Ka-Band Plan and Section 2.106 of the Commission's rules to permit O3b to operate its NGSO FSS system in the 17.8-18.3 GHz band for downlink maritime earth station operations on a non-conforming, non-interference basis. As noted above, in analyzing requests for non-conforming spectrum uses, the Commission has indicated it will generally grant such waivers where there is not potential for interference into any service authorized under the Table of Frequency Allocations and when the non-conforming operator accepts any interference from allocated services.

In this case, O3b's proposed non-conforming use of the 17.8-18.3 GHz frequency band for downlink operations will not cause harmful interference to FS operations in the same band. As discussed in the Technical Statement, O3b's downlink transmissions present no issue for these FS stations, because O3b complies with all applicable FCC and ITU downlink Power Flux Density limits.²⁰ These limits are prescribed by the ITU for the protection of terrestrial services in this band.²¹ In addition, as a non-conforming user, O3b will accept interference from FS operations in the band.

¹⁸ Technical Statement, Section A.9 at 14-15. Neither the Commission's Table of Allocations nor its Ka-band frequency plan has an allocation for Fixed Service stations in the 28.35-28.4 GHz band. Should there be any Fixed Service stations that operate in this band outside the United States and within 100 km of O3b's maritime earth stations, the procedures O3b has in place would protect them, too.

¹⁹ *Id.* at 14.

²⁰ Technical Statement, Section A.9 at 13.

²¹ Neither the Commission's Table of Allocations nor its Ka-band frequency plan has an allocation for Fixed Service stations in the 18.3-18.6 GHz band. Should there be any Fixed Service stations that operate in this

In light of the foregoing, a waiver of Section 2.106 of the Commission's rules and the Ka-Band Plan is warranted because no harmful interference will result to incumbent FS operations, O3b can operate satisfactorily within the 18 GHz microwave environment, and the public interest is otherwise served by permitting O3b to support its commercial operations.

Public interest analysis.

Grant of the Thirty-Ship Waiver Request is in the public interest. The Commission has recognized the many benefits associated with maritime earth stations. Making maritime earth stations available, it has found, “advances the Commission’s goals and objectives for market-driven deployment of broadband technologies,” which “are becoming a fundamental component of modern communications.”²² The Commission also determined that the “maritime market for broadband via satellite-based communications continues to expand” and that maritime earth stations make it possible to “deploy increasingly innovative broadband services ... to businesses and consumers on the high seas, coastlines, and inland waterways.”²³

Grant of O3b’s waiver request will advance these important objectives by enabling O3b to evaluate equipment performance and customer acceptability and to expand the supply of maritime broadband services. O3b’s maritime earth station operations offer faster connectivity at lower cost and with reduced latency. O3b’s maritime services will increase downward pressure on prices and foster innovation, all of which will redound to the benefit of maritime consumers and shipboard crew welfare. By any reasonable measure, therefore, grant of O3b’s waiver request is in the public interest.

CALEA compliance. O3b may provide services pursuant to the Thirty-Ship Waiver Request that are within the scope of CALEA. Prior to initiating any service that is subject to CALEA, O3b will verify that it has CALEA-compliant network equipment. O3b has filed, pursuant to Section 1.20005 of the Commission’s rules, the policies and procedures it has developed for ensuring compliance with CALEA.

band outside the United States, O3b’s compliance with all applicable FCC and ITU downlink Power Flux Density limits would protect them, too.

²² *ESV R&O*, 20 FCC Rcd 674, ¶ 4 (2004).

²³ *Id.*

CONCLUSION

Accordingly, and for good cause shown, O3b's request for a limited waiver of the Commission's requirements, commencing no later than December 31, 2015, should be granted.

Respectfully submitted,

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