

Before the  
Federal Communications Commission  
Washington, D.C. 20554

In the Matter of	)	
	)	
WorldVu Satellites Limited	)	IBFS File No. SAT-LOI-20160428-00041
	)	
Petition for a Declaratory Ruling Granting Access	)	Call Sign S2963
to the U.S. Market for the OneWeb NGSO FSS	)	
System	)	

**ORDER AND DECLARATORY RULING**

**Adopted: June 22, 2017**

**Released: June 23, 2017**

By the Commission: Chairman Pai and Commissioners Clyburn and O’Rielly issuing separate statements.

**I. INTRODUCTION**

1. In this Order and Declaratory Ruling, we grant the request of WorldVu Satellites Limited, d/b/a OneWeb (OneWeb), for certain rule waivers and a declaratory ruling concerning the conditions under which it will be permitted to access the U.S. market using a proposed constellation of 720 satellites authorized by the United Kingdom.<sup>1</sup> The operations proposed will be in the 10.7-12.7 GHz, 14-14.5 GHz, 17.8-18.6 GHz, 18.8-19.3 GHz, 27.5-29.1 GHz, and 29.5-30 GHz frequency bands. In granting this request, we address concerns expressed by commenters seeking various conditions on the grant and partially deny two Petitions to Deny. With this grant—the first of its kind for a new generation of large, non-geostationary-satellite orbit, fixed-satellite service (NGSO FSS) systems—the Commission facilitates OneWeb’s goal “to provide high-speed, affordable broadband connectivity to anyone, anywhere” in the United States and thereby advances the Commission’s mandate “to make available, so far as possible, to all the people of the United States . . . rapid, efficient, Nation-wide, and world-wide” communication services.<sup>2</sup>

**II. BACKGROUND**

2. *Petition.* On April 28, 2016, OneWeb filed a petition for declaratory ruling seeking access to the U.S. market for a proposed NGSO FSS satellite system.<sup>3</sup> The proposed OneWeb system consists of a constellation of 720 satellites evenly distributed in 18 near-polar orbital planes, at an

<sup>1</sup> *WorldVu Satellites Limited, Petition for a Declaratory Ruling Granting Access to the U.S. Market for the OneWeb System*, IBFS File No. SAT-LOI-20160428-00041 (filed Apr. 28, 2016) (OneWeb Petition).

<sup>2</sup> OneWeb Petition, Narrative at 2; 47 U.S.C. § 151.

<sup>3</sup> The Commission developed the market access procedure we follow here to facilitate the participation of non-U.S.-licensed satellite systems in the FCC licensing process, even though such systems do not seek a U.S. space station license. As such, favorable action on such a request is in the nature of a policy statement or declaratory ruling with respect to the availability of spectrum and other public interest considerations for future licensing of U.S. earth stations that would operate with the non-U.S.-licensed space station. *See Amendment of the Commission’s Regulatory Policies to Allow Non-U.S. Licensed Satellites to Provide Domestic and International Service in the United States*, Report and Order, 12 FCC Rcd 24094, 24106, para. 29, 24173-74, paras. 184-188 (1997) (*1997 Report and Order*). In addition to the present Petition, OneWeb must file and the Commission must approve corresponding earth station applications before OneWeb may provide its proposed services in the United States.

approximate altitude of 1200 kilometers. The satellites will operate in the 10.7-12.7 GHz (space-to-Earth), 14-14.5 GHz (Earth-to-space), 17.8-18.6 GHz (space-to-Earth), 18.8-19.3 GHz (space-to-Earth), 27.5-29.1 GHz (Earth-to-space), and 29.5-30 GHz (Earth-to-space) bands, and will be authorized by the United Kingdom. In its Petition, OneWeb sought certain waivers of the Commission's rules.<sup>4</sup>

3. *Processing Round.* On July 15, 2016, the OneWeb Petition was accepted for filing.<sup>5</sup> At the same time, a processing round was initiated for additional NGSO-like applications and petitions in the frequency bands requested by OneWeb.<sup>6</sup> The processing round closed on November 15, 2016. Eleven additional applications and petitions were filed for NGSO-like satellite systems.<sup>7</sup> Each of these applicants and petitioners proposes an NGSO FSS system that, if approved, would have the same status as OneWeb's NGSO FSS system approved here and would have the same rights in case any division of frequencies is required to avoid mutual interference.<sup>8</sup> The Commission's review of these applications and petitions is ongoing.<sup>9</sup>

4. *Comments.* Telesat Canada (Telesat) and the MVDDS<sup>10</sup> 5G Coalition (MVDDS Coalition) filed petitions to deny the OneWeb Petition, based on concerns related to international coordination and terrestrial sharing, respectively.<sup>11</sup> Other satellite operators filed comments expressing concerns regarding sharing with other FSS operations.<sup>12</sup> SES and O3b requested that any grant to

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<sup>4</sup> See *infra* paras. 14-19.

<sup>5</sup> *OneWeb Petition Accepted for Filing, IBFS File No. SAT-LOI-20160428-00041; Cut-Off Established for Additional NGSO-Like Satellite Applications or Petitions for Operations in the 10.7-12.7 GHz, 14.0-14.5 GHz, 17.8-18.6 GHz, 18.8-19.3 GHz, 27.5-28.35 GHz, 28.35-29.1 GHz, and 29.5-30.0 GHz Bands*, Public Notice, 31 FCC Red 7666 (IB 2016).

<sup>6</sup> *Id.*; see also 47 CFR § 25.157(a) (defining "NGSO-like satellite operation" as operation of any NGSO satellite system, and operation of a geostationary-satellite orbit, mobile-satellite service satellite to communicate with earth stations with non-directional antennas).

<sup>7</sup> See IBFS File Nos. SAT-MOD-20160624-00060 and SAT-AMD-20161115-00116 (O3b Limited); SAT-PDR-20161115-00108 (Telesat Canada); SAT-LOA-20161115-00109 (The Boeing Company); SAT-PDR-20161115-00111 (Space Norway AS); SAT-PDR-20161115-00112 (LeoSat MA, Inc.); SAT-LOA-20161115-00113 (Karousel LLC); SAT-PDR-20161115-00114 (Kepler Communications Inc.); SAT-LOA-20161115-00117 (Audacy Corporation); SAT-LOA-20161115-00118 (Space Exploration Holdings, LLC (SpaceX)); SAT-PDR-20161115-00120 (ViaSat, Inc.); SAT-LOA-20161115-00121 (Theia Holdings A, Inc.).

<sup>8</sup> See *infra* para. 17.

<sup>9</sup> See *infra* para. 11.

<sup>10</sup> MVDDS is an abbreviation of the Multichannel Video Distribution and Data Service and is licensed under Part 101 of the Commission's rules. MVDDS is currently defined as a "fixed microwave service licensed in the 12.2-12.7 GHz band that provides various wireless services. Mobile and aeronautical operations are prohibited." 47 CFR § 101.3.

<sup>11</sup> Telesat Petition to Deny (filed Aug. 15, 2016); MVDDS Coalition Petition to Deny (filed Aug. 15, 2016).

<sup>12</sup> SpaceX Comments at 8-15 (filed Aug. 15, 2016); SES S.A. and O3b Limited Comments at 4-7 (filed Aug. 15, 2016) (SES and O3b). SpaceX also requested that we defer consideration of the Petition until OneWeb provided information concerning an announced merger with Intelsat SA and significant new investment by SoftBank Group Corporation. Letter from Tim Hughes, SVP, Global Business & Government Affairs, SpaceX, to Marlene H. Dortch, Secretary, FCC (filed Apr. 4, 2017). Because the announced transaction is no longer planned, this request is moot. Boeing and SpaceX also requested further information from OneWeb regarding its plans to mitigate orbital collisions and debris. Boeing Comments at 4-5; SpaceX Comments at 17-22. Because OneWeb subsequently provided its orbital debris plan, this request is moot. Letter from Jennifer D. Hindin, Counsel to OneWeb, to Marlene H. Dortch, Secretary, FCC (filed Nov. 10, 2016). SES and O3b requested further technical information from OneWeb, SES and O3b Comments at 4-7, which OneWeb provided, also rendering this request moot. OneWeb Opposition and Response (filed Aug. 25, 2016). Ligado supported SES and O3b's request and asked OneWeb to provide further technical information on how OneWeb would mitigate potential interference from its

(continued....)

OneWeb be subject to the same conditions that were placed on the grant of U.S. market access for the O3b NGSO FSS system.<sup>13</sup> ViaSat commented that the OneWeb Petition should be considered in conjunction with other applications and petitions filed in the processing round after their technical details are known, including with respect to aggregate interference, but ViaSat did not take a position regarding the issues in OneWeb's petition.<sup>14</sup> The National Radio Astronomy Observatory (NRAO) expressed concerns about possible interference to radio astronomy facilities<sup>15</sup> and the Governor of the State of Alaska encouraged the Commission to grant OneWeb's Petition.<sup>16</sup> OneWeb opposed the petitions to deny and responded to the comments.<sup>17</sup> In addition, EchoStar and Hughes argue in filings made after the close of the comment period that geostationary-satellite orbit (GSO) FSS satellite operators should be entitled to operate on a co-equal basis with OneWeb in the 18.8-19.3 GHz band.<sup>18</sup>

### III. DISCUSSION

5. After review of the record, including *ex parte* letters filed after the public release of the draft of this Order,<sup>19</sup> we conclude that grant of the OneWeb Petition will serve the public interest, subject to the requirements and conditions specified herein.<sup>20</sup> Our public interest analysis considers the effect of the proposed OneWeb system on competition in the United States, as well as issues of spectrum availability, eligibility requirements and operating requirements, and national security, law enforcement, foreign policy, and trade.<sup>21</sup> Below, we address the various outstanding issues raised by commenters on the Petition. We also address OneWeb's waiver requests. Where appropriate, we defer matters of general applicability to ongoing or potential future rulemakings.

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proposed system into GSO gateway operations. Ligado Reply at 2 (filed Sept. 1, 2016). To the extent Ligado seeks more information from OneWeb than it provided in its Petition and response to SES and O3b's Comments, we view no basis for requiring such information in Ligado's filing. OneWeb has provided sufficient technical showings regarding these matters.

<sup>13</sup> SES and O3b Comments at 7-10.

<sup>14</sup> See ViaSat Comments (filed Aug. 15, 2016); ViaSat Reply at 1 (filed Sept. 1, 2016). Ligado supported deferring consideration of the OneWeb Petition until after the close of the processing round. Ligado Reply at 2-3.

<sup>15</sup> Letters from Harvey S. Liszt, National Radio Astronomy Observatory, to Marlene H. Dortch, Secretary, FCC (filed July 24 and Sept. 6, 2016).

<sup>16</sup> Letter from Bill Walker, Governor, State of Alaska, to the Honorable Tom Wheeler, Chairman, FCC (filed Aug. 3, 2016) ("I am particularly enthused about the fact that OneWeb's network of satellites will be moving in a pole to pole direction, such that Alaska and other Arctic regions will receive tremendous coverage.").

<sup>17</sup> OneWeb Opposition and Response.

<sup>18</sup> Letters from Jennifer A. Manner, Senior Vice President, Regulatory Affairs, EchoStar, to Marlene H. Dortch, Secretary, FCC (filed Sept. 21 and 30, 2016).

<sup>19</sup> Letter from the MVDDS Coalition to Marlene H. Dortch, Secretary, FCC (filed June 9, 2017); Letters from John P. Janka, Counsel to ViaSat, Inc., to Marlene H. Dortch, Secretary, FCC (filed June 13, 2017) (*June 13 ViaSat Ex Parte*); Letters from Elizabeth R. Park, Counsel to ViaSat, Inc., to Marlene H. Dortch, Secretary, FCC (filed June 15 and 16, 2017); Letter from Suzanne Malloy, Vice President, Regulatory Affairs, O3b Limited, to Marlene H. Dortch, Secretary, FCC (filed June 14, 2017) (*O3b Ex Parte*); Letter from William M. Wiltshire, Counsel to SpaceX, to Marlene H. Dortch, Secretary, FCC (filed June 14, 2017) (*June 14 SpaceX Ex Parte*); Letter from William M. Wiltshire, Counsel to SpaceX, to Marlene H. Dortch, Secretary, FCC (filed June 15, 2017); Letter from Douglas A. Svor, Counsel to OneWeb, to Marlene H. Dortch, Secretary, FCC (June 15, 2017).

<sup>20</sup> *1997 Report and Order*, 12 FCC Rcd at 24106, para. 29.

<sup>21</sup> *Id.* Except as otherwise discussed herein, we conclude that the OneWeb Petition satisfies these basic requirements for U.S. market access.

6. *12.2-12.7 GHz.* The MVDDS Coalition raises several arguments for denying OneWeb’s request for U.S. market access in the 12.2-12.7 GHz band.<sup>22</sup> The MVDDS Coalition argues that granting OneWeb’s request will prejudice the MVDDS Coalition’s Petition for Rulemaking, filed days before the OneWeb Petition, to add a mobile allocation to the 12.2-12.7 GHz band, delete or make secondary the existing co-primary, NGSO FSS allocation, and change other rules to allow Multichannel Video Distribution and Data Service (MVDDS) licensees to provide “5G” two-way mobile and fixed terrestrial services.<sup>23</sup> The MVDDS Coalition states that “viable 5G services in the 12.2-12.7 GHz band require eliminating or designating as secondary the unused NGSO FSS allocation at 12.2-12.7 GHz.”<sup>24</sup> However, the pendency of the MVDDS Coalition’s Petition for Rulemaking is not a sufficient reason to delay or deny OneWeb’s Petition to use the band under the existing FSS allocation and service rules.<sup>25</sup> Rather, we are granting the OneWeb petition subject to the outcome of the pending MVDDS Coalition Petition for Rulemaking. As such, today’s conditional grant of OneWeb’s request does not preclude the Commission from initiating a rulemaking proceeding regarding the 12.2-12.7 GHz band on its own motion or in response to a petition for rulemaking, including the MVDDS Coalition’s pending Petition, in the manner that best serves the public interest. Nonetheless, we note that OneWeb’s request includes several additional frequency bands, such that even if NGSO FSS systems were precluded entirely from the 12.2-12.7 GHz band, OneWeb would still retain a measure of flexibility to provide its proposed services. Accordingly, any investments made toward operations in this band by OneWeb in the United States assume the risk that operations may be subject to additional conditions or requirements as a result of such Commission actions.

7. In addition to the general claim that granting OneWeb’s market access request would prejudice the MVDDS Coalition’s pending Petition for Rulemaking discussed above, the MVDDS Coalition argues that the Commission’s current rules make deployment of coexisting “current generation” MVDDS and NGSO FSS systems “practically infeasible” because of the large distances that would be required to prevent MVDDS operations from interfering with NGSO FSS earth stations.<sup>26</sup> This argument for denying the OneWeb Petition is based on challenges to the adequacy of current rules for MVDDS and NGSO FSS systems sharing the band. As such, the Coalition is either seeking reconsideration—on a grossly untimely basis—of the Commission’s *2002 MVDDS Memorandum Opinion and Order and Second Report and Order* that established the current sharing rules for the 12.2-12.7 GHz band, or

<sup>22</sup> MVDDS Coalition Petition to Deny; MVDDS Coalition Reply (filed Sept. 1, 2016); *see also* Letters from the MVDDS Coalition to Marlene H. Dortch, Secretary, FCC (filed Aug. 12 and 19, Sept. 16, and Oct. 28, 2016). In a later filing, the MVDDS Coalition supported adoption of a draft of this Order with the discussion of MVDDS issues contained herein. Letter from MVDDS 5G Coalition, to Marlene H. Dortch, Secretary, FCC, at 2 (filed June 9, 2017). The draft Order was released for public comment by the Chairman’s office on June 1, 2017.

<sup>23</sup> MVDDS Coalition Petition to Deny at 13-15; *Petition of MVDDS 5G Coalition Petition for Rulemaking*, RM-11768, April 26, 2016; *see also* Petition for Rulemakings Filed, Public Notice, Report No. 3042 (May 9, 2016).

<sup>24</sup> *See, e.g.*, Letters from the MVDDS Coalition to Marlene H. Dortch, Secretary, FCC, at 4 (filed Aug. 12 & 19, 2016); *see also* RM 11768, MVDDS Coalition Comments at 7 (quoting MVDDS 5G Coalition Petition for Rulemaking at 22).

<sup>25</sup> Under the approach that the Commission adopted for NGSO FSS and MVDDS sharing, first in-time NGSO FSS receivers and first in-time MVDDS transmitting systems are afforded more and easier use of the shared 12.2-12.7 GHz portion of spectrum than subsequent deployments. The Commission concluded that such a result is equitable and consistent with the co-primary status of NGSO FSS and MVDDS. *See Amendment of Parts 2 and 25 of the Commission’s Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency Range; Amendment of the Commission’s Rules to Authorize Subsidiary Terrestrial Use of the 12.2-12.7 GHz Band by Direct Broadcast Satellite Licensees and Their Affiliates*, Memorandum Opinion and Order and Second Report and Order, 17 FCC Rcd 9614, 9659, para. 111 (2002) (*2002 MVDDS Memorandum Opinion and Order and Second Report and Order*).

<sup>26</sup> MVDDS Coalition Petition to Deny at 5 (citing Tom Peters, *MVDDS 12.2-12.7 GHz NGSO Coexistence Study* at 6 (Aug. 15, 2016) (MVDDS/NGSO Technical Analysis) attached to the Coalition’s Petition as Exhibit 1).

presenting arguments that may be appropriate to make in support of its pending Petition for Rulemaking, but which are outside the scope of our consideration of OneWeb's market access request in this proceeding.

8. Further, the MVDDS Coalition asserts that coexistence between co-primary terrestrial MVDDS and NGSO systems serving FSS earth stations in motion will “destroy” or “seal the fate” of MVDDS licensed services by rolling out a system that requires so many earth station receivers that it will preclude the installation of a sufficient number of MVDDS transmitting antennas to sustain that service, given the requirement in the current rules that such transmitting antennas cannot be located within 10 km of any qualifying NGSO FSS receiver notwithstanding the co-primary status of MVDDS and NGSO FSS.<sup>27</sup> A grant of U.S. market access includes no authority to deploy earth stations in the United States.<sup>28</sup> Authority for such earth stations must be requested in an appropriate earth station application. Any relevant arguments for such authority can be raised and will be fully and properly considered as part of such an earth station application.<sup>29</sup> As such, grant of the OneWeb Petition for market access does not directly affect MVDDS licensees—who are already operating as co-primary to NGSO FSS operations in this band—or prejudice later requests to operate earth stations in motion that receive from NGSO FSS space stations in the band. Nonetheless, given OneWeb's plan to request waivers in future earth station applications,<sup>30</sup> and the MVDDS licensees' concerns, we believe that clarifying how the current first-in-time sharing rules would apply to any earth stations in motion authorized in the future to receive from NGSO FSS space stations in the band would be useful to avoid confusion and uncertainty.<sup>31</sup> Accordingly, we clarify that such earth stations would be outside of the scope of the existing sharing rules involving terrestrial and satellite users in this band. In particular, the MVDDS minimum distance separation requirement is inapplicable to earth stations that are not at fixed locations. Absent an agreement among the relevant parties, under the existing rules MVDDS licensees are not required to observe any minimum distance separation from any NGSO FSS earth stations in motion that may be authorized in the future in the 12.2-12.7 GHz band.<sup>32</sup>

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<sup>27</sup> See MVDDS Coalition Petition to Deny at 7-8; MVDDS Coalition Reply at 8.

<sup>28</sup> Accordingly, and contrary to the Coalition's assertions, the OneWeb Petition is not procedurally defective for failing to request a waiver of the U.S. Table of Frequency Allocations to provide mobile-satellite service in this band or to operate earth stations in motion. See MVDDS Coalition Petition to Deny at 3, 8-9. In addition, we need not address here OneWeb's request for waiver of section 25.202(a)(1), n.6, which prohibits deployment of ubiquitous, co-primary NGSO FSS earth stations terminals in the 10.7-11.7 GHz band. We dismiss this waiver request below without prejudice.

<sup>29</sup> We note also that section 25.208(o) contains power flux-density limits designed to protect MVDDS. 47 CFR § 25.208(o); see also 47 CFR §§ 101.147(p), 101.1409 (incumbent public safety licensees shall be afforded protection from MVDDS and NGSO FSS licensees).

<sup>30</sup> See Letter from Kalpak Gude, Vice President of Legal-Regulatory, WorldVu Satellites Limited, to Marlene Dortch, Secretary, FCC, at 5 (filed June 24, 2016) (when it applies for earth station licenses OneWeb will address with appropriate waivers the fact that the Commission's rules do not include rules governing the operation of earth stations in motion transmitting to NGSO space stations in frequencies allocated to the FSS); see also Letter from Jose P. Albuquerque, Chief, Satellite Division, FCC International Bureau, to Kalpak S. Gude, Vice President of Legal-Regulatory, WorldVu Satellites Limited, IBFS File No. SAT-LOI-20160428-00041, at 2 (June 10, 2016).

<sup>31</sup> Compare 47 CFR § 2.1 (defining fixed-satellite service as a “radiocommunication service between earth stations at given positions, when one or more satellites are used; the given position may be a specified fixed point or any fixed point within specified areas”) with 47 CFR § 2.1 (defining mobile-satellite service as a radiocommunication service between earth stations intended to be used while in motion or during halts at unspecified points and one or more space stations, or between mobile earth stations by means of one or more space stations).

<sup>32</sup> See 47 CFR § 101.129(b).

9. *ITU Coordination.* In its Petition to Deny, Telesat observes that international coordination will be required between the OneWeb system and its own NGSO FSS system.<sup>33</sup> Telesat argues that, at minimum, any grant to OneWeb should be conditioned upon compliance with this international obligation. OneWeb agrees to such a requirement,<sup>34</sup> and we have included it below as a requirement of the grant, resolving Telesat's concerns and thereby eliminating them as a basis for denying the OneWeb Petition.<sup>35</sup>

10. *Radio Astronomy.* In two letters, NRAO emphasizes the need for OneWeb to coordinate with certain radio telescope facilities prior to commencing operations, pursuant to footnote US131 to the U.S. Table of Frequency Allocations.<sup>36</sup> We remind OneWeb of this obligation, and include a requirement below concerning coordination with radio astronomy facilities.<sup>37</sup>

11. *Consideration with Pending Applications and Petitions.* In its comments, ViaSat argues that the OneWeb Petition must be considered together with all other applications and petitions filed in the OneWeb processing round, and that parties should be afforded an opportunity to comment after the details of these systems are known.<sup>38</sup> As noted above, the OneWeb processing round closed on November 15, 2016. We have performed an initial review of the technical proposals made by the other applicants and petitioners and conclude there is no need to delay grant of the OneWeb Petition until these requests are addressed, in light of the spectrum sharing method among NGSO FSS operators that we require below.<sup>39</sup> This spectrum sharing method—the avoidance of “in-line interference events”—provides for equal spectrum access rights among all grantees in a processing round, regardless of the time of their grant. Rather, when an “in-line event” occurs between any operators authorized in a processing round and no coordination agreement is reached to address the potential interference, the operators are restricted to using an equal but separate portion of their commonly authorized frequencies to avoid causing harmful interference to each other.<sup>40</sup> No spectrum preference is given based on the date of grant. No commenter,

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<sup>33</sup> Telesat Petition to Deny; Telesat Reply (filed Sept. 1, 2016); *see also* International Telecommunication Union (ITU) Radio Regulations, No. 9.12 (requiring coordination of certain NGSO systems), No. 9.53 (requiring both parties in coordination to “make every possible mutual effort to overcome [coordination] difficulties, in a manner acceptable to the parties concerned”), No. 11.42 (requiring the immediate cessation of harmful interference actually caused to a recorded assignment with which coordination is required but has not been effected).

<sup>34</sup> OneWeb Opposition and Response at 20-22.

<sup>35</sup> *See infra* para. 23(a). Compliance with ITU coordination procedures is a requirement of the ITU Radio Regulations, which hold the force of treaty to which the United States is a party. Such compliance is a typical condition of both U.S. space station licenses and grants of U.S. market access. *See* 47 CFR § 25.111(b); *see also, e.g., Inmarsat Mobile Networks, Inc., Application to Operate a Fixed-Satellite Service Gateway Earth Station Facility in Lino Lakes, Minnesota with the Inmarsat-5 F2 Space Station*, Order and Authorization and Declaratory Ruling, 30 FCC Rcd. 2770, 2784, para. 41c (IB 2015).

<sup>36</sup> 47 CFR § 2.106, n.US131.

<sup>37</sup> *See infra* para. 24(b). Such coordination can be based on relevant international recommendations, as NRAO suggests. NRAO July 24, 2016 Letter at 1-2.

<sup>38</sup> ViaSat Comments at 2.

<sup>39</sup> The International Bureau recently placed all but one of these applications and petitions on public notice as acceptable for filing in certain frequency bands. *Applications Accepted for Filing; Cut-off Established for Additional NGSO-like Satellite Applications or Petitions for Operations in the 12.75-13.25 GHz, 13.85-14.0 GHz, 18.6-18.8 GHz, 19.3-20.2 GHz, and 29.1-29.5 GHz Bands*, Public Notice, DA 17-524 (IB rel. May 26, 2017). Because the comment periods have not closed, we are not yet in a position to act on these subsequent requests. In addition, we address ViaSat's concerns of aggregate interference from NGSO FSS systems into GSO FSS networks by the requirement in paragraph 25(a), below.

<sup>40</sup> *See* 47 CFR § 25.261.

including ViaSat, submitted any filings after the close of the processing round opposing the OneWeb Petition on the basis of the other system proposals.

12. *Effect on the Pending NGSO FSS NPRM and Future Proceedings.* In its comments, Space Exploration Technologies Corp. (SpaceX) argues that the OneWeb system design makes inefficient use of spectrum and will hinder shared use by other operators.<sup>41</sup> EchoStar and Hughes argue in filings made after the comment period that in the 18.8-19.3 GHz band, in which NGSO FSS is designated as the primary service, GSO FSS satellite operators should be allowed to operate on a co-equal basis with OneWeb.<sup>42</sup> Both of these issues have been raised in a pending Notice of Proposed Rulemaking concerning NGSO FSS matters.<sup>43</sup> We defer consideration of these broadly applicable matters to that proceeding and, as indicated above, have decided to condition grant of the OneWeb Petition on the outcome of any rulemaking proceedings, which includes that one.<sup>44</sup> As with the MVDDS Coalition's Petition for Rulemaking, we note that grant of the OneWeb Petition will not prejudice any decision, including a contrary action, in the NGSO FSS rulemaking.<sup>45</sup> Rather, decisions of general applicability in the *NGSO FSS NPRM* proceeding will be based on the totality of comments and proposals in that proceeding, including OneWeb's. OneWeb will not receive any special exemptions to the rulemaking based solely on this grant, should OneWeb choose to accept it.<sup>46</sup> Accordingly, we disagree that grant of the OneWeb Petition would be premature until after the conclusion of the *NGSO FSS NPRM*.<sup>47</sup>

13. *Conditions.* Below, we condition this grant of U.S. market access in response to comments and as warranted in the public interest.<sup>48</sup> These conditions relate to ITU coordination, power limits, avoidance of in-line interference, orbital debris mitigation, future rulemakings, bond and milestone requirements, and other existing requirements in our rules and in footnotes to the Table of Frequency Allocations. We also include specific conditions related to our waiver grants. In their comments, SES and O3b ask that we impose on any grant for the OneWeb system the same conditions that were imposed on O3b's NGSO FSS constellation. We do so below, with one exception. O3b's grant of market access and earth station authorizations permit continued communications with the O3b constellation even if O3b makes certain adjustments to its constellation configuration.<sup>49</sup> OneWeb has not requested such a condition, and, in any event, it is unclear whether such a condition is appropriate for OneWeb's constellation configuration. Accordingly, we do not include such a condition below.

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<sup>41</sup> SpaceX Comments at 2, 4-17.

<sup>42</sup> Letters from Jennifer A. Manner, Senior Vice President, Regulatory Affairs, EchoStar, to Marlene H. Dortch, Secretary, FCC (filed Sept. 21 and 30, 2016).

<sup>43</sup> *Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters*, Notice of Proposed Rulemaking, 31 FCC Rcd 13651, 13656-58, paras. 12, 17 (2016) (*NGSO FSS NPRM*).

<sup>44</sup> See *infra* para. 26; see also Terra Bella Reply (Sept. 1, 2016) (urging reallocation of certain bands to the Earth exploration-satellite service).

<sup>45</sup> We decline ViaSat's proposed insertion to this sentence as the current text already covers the point made by ViaSat: that the Commission's grant here does not prejudice any aspect of the NGSO FSS rulemaking, notwithstanding any statement made regarding that proceeding in this Order. *June 13 ViaSat Ex Parte*, Exh. A at 7.

<sup>46</sup> OneWeb may petition for reconsideration of this grant to seek deferral of any of its conditions until after the Commission has made a determination on the relevant issues in the pending NGSO FSS rulemaking. See 47 CFR § 1.106(c)(2).

<sup>47</sup> Telesat Reply at 3-4; see also *June 14 SpaceX Ex Parte* at 2 (urging the Commission to focus on completing the NGSO FSS rulemaking).

<sup>48</sup> See *infra* paras. 23-28.

<sup>49</sup> *O3b Limited*, IBFS File Nos. SAT-LOI-20141029-00118 and SAT-AMD-20150115-00004, Condition 11 (grant stamp dated Jan. 22, 2015).

14. *Waiver Standard.* OneWeb seeks waivers of several of the Commission's rules.<sup>50</sup> Generally, the Commission may waive any rule for good cause shown.<sup>51</sup> Waiver is appropriate where the particular facts make strict compliance inconsistent with the public interest.<sup>52</sup> In making this determination, we may take into account considerations of hardship, equity, or more effective implementation of overall policy on an individual basis.<sup>53</sup> Waiver is therefore appropriate if special circumstances warrant a deviation from the general rule and such deviation will serve the public interest.<sup>54</sup> We address the specific requests for waivers below.

15. *Waivers for 17.8-18.6 GHz.* OneWeb seeks waivers of the U.S. Table of Frequency Allocations for operations in the 17.8-18.6 GHz band.<sup>55</sup> Within this range, the 17.8-18.3 GHz band is presently not allocated to the FSS. The 18.3-18.6 GHz band is allocated to the FSS, but limited to GSO networks.<sup>56</sup> OneWeb states that it would operate a limited number of gateway earth stations in these bands.<sup>57</sup> In the 17.8-18.3 GHz band, OneWeb provided technical demonstrations to show that it will comply with international power flux-density (PFD) limits designed to protect terrestrial services. In the 18.3-18.6 GHz band, OneWeb provided technical demonstrations showing that it will comply with international equivalent power flux-density (EPFD) limits designed to protect GSO networks. In addition, it states that gateways operating with the OneWeb system would not claim protection from harmful interference in these bands.<sup>58</sup>

16. In light of OneWeb's technical demonstrations, and its willingness to operate on a secondary basis, we find good cause to grant a waiver of the Table of Frequency Allocations for operations in this band. Grant of this waiver will not undermine the purpose of the rule, which is to ensure that primary users of the bands are not constrained. As noted in the preceding paragraph, OneWeb provided technical demonstrations of how it will protect both primary terrestrial operations and GSO FSS operations. No commenter in this proceeding has objected to those technical demonstrations. In addition, OneWeb states that deployment in these bands will be limited to gateway earth stations, which are more likely than ubiquitous user terminals to be able to operate compatibly with primary terrestrial services because they are typically fewer in number and make use of larger earth station antennas, which, by

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<sup>50</sup> OneWeb requests waivers of sections 2.106, 25.157(e), 25.146(a)(1)(iii), and 25.146(a)(2)(iii) of the Commission's rules and waiver of the Commission's Ka-band Plan. OneWeb also requests a waiver of footnote NG52 to the U.S. Table of Frequency Allocations, 47 CFR § 2.106, which pertains to geostationary satellites. Because OneWeb does not propose operations of geostationary satellites, we dismiss this waiver request as moot. However, OneWeb has stated that "FS operators would not be required to coordinate their station operations with OneWeb's receive only user terminals, because OneWeb has agreed to accept any level of interference from FS stations into its user terminals." OneWeb Petition, Narrative at 25. As noted above, we also dismiss without prejudice OneWeb's request for waiver of section 25.202(a)(1), n.6, restricting use of the 10.7-11.7 GHz band by NGSO FSS systems to operations with gateway earth stations, to refile in connection with such an application.

<sup>51</sup> 47 CFR § 1.3.

<sup>52</sup> *Northeast Cellular Tel. Co. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990).

<sup>53</sup> *WAIT Radio v. FCC*, 418 F.2d 1153, 1159 (D.C. Cir. 1969), *cert. denied*, 409 U.S. 1027 (1972); *Northeast Cellular*, 897 F.2d at 1166.

<sup>54</sup> *Northeast Cellular*, 897 F.2d at 1166.

<sup>55</sup> 47 CFR §§ 2.102(a), 2.106. Non-Federal operations in this band are subject to coordination with Federal systems. 47 CFR § 2.106, n.US334.

<sup>56</sup> 47 CFR § 2.106, n.NG164.

<sup>57</sup> OneWeb Petition, Attach. A at 6, 41. OneWeb anticipates operating in at least four gateway earth station sites in the United States, with a worldwide total of approximately 50 or more gateway earth station sites. *Id.* at 6.

<sup>58</sup> Letter from Kalpak S. Gude, Vice President of Legal-Regulatory, WorldVu Satellites Limited, to Marlene H. Dortch, Secretary, FCC, at 1-2 (filed June 24, 2016).

limiting off-axis antenna gain, pose a lower risk of receiving harmful interference from terrestrial stations. Indeed, OneWeb's proposed operations with gateway earth stations are more limited than the proposal the Commission has recently made to allow NGSO FSS operation in these bands on a secondary basis with any individually licensed earth station, subject to such power limits.<sup>59</sup> These operations should not pose the undue burden on terrestrial services that the Commission feared in 2000 might arise from general secondary FSS operations, because OneWeb's proposed limited gateway operations can be more easily sited and operated in a manner to avoid receiving harmful interference.<sup>60</sup> We therefore conclude that a waiver is justified. Consistent with OneWeb's statements, we grant this waiver for OneWeb's non-conforming operations in this band on condition that gateways operating with the OneWeb system will not claim protection from harmful interference in these bands, and remind OneWeb that it undertakes these operations at its own risk.

17. *Waiver of Band-Splitting Procedure.* OneWeb seeks to operate in the United States throughout the 10.7-12.7 GHz, 14-14.5 GHz, 17.8-18.6 GHz, 18.8-19.3 GHz, 27.5-29.1 GHz, and 29.5-30 GHz frequency bands. In frequencies that include some of these bands, specifically the 10.7-12.7 GHz, 12.75-13.25 GHz, 13.75-14.5 GHz, 18.8-19.3 GHz and 28.6-29.1 GHz bands, the Commission has adopted rules and policies to allow shared use of frequencies among NGSO FSS systems by avoidance of in-line interference events.<sup>61</sup> In other bands, section 25.157(e) of the Commission's rules provides for "available spectrum" to be "divided equally" among the applications granted as the result of a processing round.<sup>62</sup> This rule presumes that NGSO operators cannot use the same frequencies without causing harmful interference to each other, and therefore must be assigned discrete segments of the requested band. OneWeb requests a waiver of section 25.157(e) to permit it to share the 17.8-18.6 GHz, 27.5-28.6 GHz, and 29.5-30 GHz bands with other NGSO FSS operators through avoidance of in-line interference events, rather than by assignment of only a portion of these bands.

18. Based on our technical review of the OneWeb Petition and of other applications and petitions that were submitted in the OneWeb processing round, we conclude that sharing will be possible between the OneWeb system and other proposed NGSO FSS systems in all of the bands requested by OneWeb. The earth stations that will communicate with the OneWeb constellation will have directional antennas.<sup>63</sup> This directionality, which permits avoidance of in-line interference with other NGSO FSS systems in the 10.7-12.7 GHz, 14-14.5 GHz, 18.8-19.3 GHz, and 28.6-29.1 GHz bands, also permits avoidance of in-line interference in the 17.8-18.6 GHz, 27.5-28.6 GHz, and 29.5-30 GHz bands. Thus, because OneWeb's particular system design enables sharing by avoiding in-line interference events in all

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<sup>59</sup> *NGSO FSS NPRM*, 31 FCC Rcd at 13655-56, paras. 9-10. Accordingly, OneWeb's operations would be consistent with the Commission's proposal, were the Commission to decide to open up this band for NGSO FSS secondary operations.

<sup>60</sup> *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*, Report and Order, 15 FCC Rcd 13430, 13459, para. 58 (2000); see also generally *Inmarsat Mobile Networks, Inc., Application to Operate a Fixed-Satellite Service Gateway Earth Station Facility in Lino Lakes, Minnesota with the Inmarsat-5 F2 Space Station*, Order and Authorization and Declaratory Ruling, 30 FCC Rcd 2770, 2778-79, para. 25 (IB/OET 2015) (approving GSO FSS operations in the 17.7-18.3 GHz band because the PFD on the earth's surface would be below levels established by the ITU to protect terrestrial services and would be unlikely to affect other services).

<sup>61</sup> 47 CFR § 25.261; *The Establishment of Policies and Service Rules for the Non-Geostationary Satellite Orbit, Fixed Satellite Service in the Ka-band*, Report and Order, 18 FCC Rcd 14708, 14714, para. 18 (2003); *The Establishment of Policies and Service Rules for the Non-Geostationary Satellite Orbit, Fixed Satellite Service in the Ku-band*, Report and Order, 17 FCC Rcd 7841, 7850, para. 27 (2002).

<sup>62</sup> 47 CFR § 25.157(e).

<sup>63</sup> OneWeb Petition, "Ku masks" and "Ka masks" .mdb files (providing information on antenna gain of proposed earth stations).

requested bands, division of available spectrum would be unnecessarily restrictive. Grant of a waiver in this instance will not undermine the purpose of section 25.157(e), which presumes that NGSO-like operations cannot share frequencies without causing harmful interference, because in this case the bands can be successfully shared.<sup>64</sup> In contrast, enforcing the band-splitting procedure would result in inefficient use of scarce spectrum resources, contrary to the public interest and the expressed desires of competing NGSO FSS participants in the OneWeb processing round.<sup>65</sup> For similar reasons, the Commission has proposed to extend the avoidance of in-line interference mechanism to the additional bands requested by OneWeb.<sup>66</sup> We therefore find good cause to waive section 25.157(e).

19. *Waivers for EPFD Software Code.* Section 25.146 requires NGSO FSS applicants in certain bands to use software to demonstrate that their systems will comply with EPFD limits included in section 25.208.<sup>67</sup> If software approved by the ITU is not available, applicants must provide the source code used. OneWeb utilized a beta version of EPFD software in development with the ITU, a final version of which was subsequently approved by the ITU.<sup>68</sup> OneWeb requests waiver of the requirement to provide its source code in light of the proprietary nature of the third-party software, and given that its version had not been approved by the ITU at the time of use. We find good cause for waiver of the source code requirement in section 25.146(a)(1)(iii), (2)(iii), based on OneWeb's use of this software in development with the ITU, but condition the grant on the requirement that OneWeb satisfactorily undergo the ITU review process of its EPFD demonstration prior to initiation of service. Review by the ITU of OneWeb's compliance with ITU EPFD limits, using methods now approved by the ITU, will provide sufficient additional assurances that OneWeb will comply with the identical EPFD limits in section 25.208 beyond the other technical demonstrations OneWeb has already provided.<sup>69</sup> Thus, grant of this waiver will not undermine the purpose of the rule to reasonably ensure compliance with the relevant EPFD limits.<sup>70</sup>

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<sup>64</sup> See *Amendment of the Commission's Space Station Licensing Rules and Policies*, First Report and Order, 18 FCC Rcd 10760, 10865-66, para. 275 (2003) (declining to impose the band-splitting approach in section 25.157(e) to NGSO FSS applicants that proposed to share spectrum using the avoidance of in-line interference method).

<sup>65</sup> See Telesat Petition to Deny at 3 (“Band-splitting will provide too little spectrum to each of the applicants, resulting in no systems being launched.”); SpaceX Comments at 15 (“SpaceX agrees with OneWeb that the Commission should not reflexively impose the automatic band segmentation approach upon the current generation of participants in the upcoming NGSO processing round, and should instead proceed with a regime based on avoidance of in-line interference events.”); see also Boeing Comments at 3 (“The Commission’s rule regarding avoidance of in-line interference events in the Ka-band may better facilitate spectrum sharing among NGSO FSS systems” than band segmentation).

<sup>66</sup> *NGSO FSS NPRM*, 31 FCC Rcd at 13660-61, para. 23. Accordingly, OneWeb’s operations here would also be consistent with the Commission’s proposal, should the Commission decide to adopt this proposal in the NGSO FSS NPRM proceeding. However, the grant of the waiver here for OneWeb’s operations does not predetermine the Commission’s ultimate decision regarding the ability of in-line interference avoidance mechanisms to obviate the need for band-splitting, which will be based on the record in that proceeding.

<sup>67</sup> 47 CFR §§ 25.146(a)(1)(iii), (2)(iii), 25.208. This showing is separate from the showing that must be made, 90 days prior to initiation of service, that OneWeb complies with a different set of EPFD limits. See *infra* para. 24(e).

<sup>68</sup> Letter from Francois Rancy, Director, ITU Radiocommunication Bureau, to Administrations of ITU Member States, “Examinations under Resolution 85 (WRC-03)” (Dec. 6, 2016), <https://www.itu.int/md/R00-CR-CIR-0414/en>. OneWeb modified the beta software to reflect the specifics of its system design.

<sup>69</sup> We note that this is the only information disclosure required by our rules for which OneWeb seeks a waiver; OneWeb has provided all other information required for its Petition by our rules. See *generally* 47 CFR §§ 25.114, 25.137, 25.145, 25.146.

<sup>70</sup> See *infra* para. 24(d).

20. *Other.* In the 14-14.2 GHz band, the National Aeronautics and Space Administration operates Tracking and Data Relay Satellite System facilities at three locations: Guam (latitude 13°36'55" N, longitude 144°51'22" E); White Sands, New Mexico (latitude 32°20'59" N, longitude 106°36'31" W and latitude 32°32'40" N, longitude 106°36'48" W); and Blossom Point, Maryland. For transmissions in the 14-14.2 GHz band from NGSO FSS earth stations located within 125 kilometers of these three sites, the earth station operators should take account of the NASA facilities.

#### IV. CONCLUSION AND ORDERING CLAUSES

21. We conclude that grant of the OneWeb Petition, as conditioned herein, will serve the public interest by enabling OneWeb to pursue its goal of providing broadband Internet access to communities across the United States.

22. Accordingly, IT IS ORDERED, that the Petition for Declaratory Ruling filed by WorldVu Satellites Limited, d/b/a OneWeb, IS GRANTED, pursuant to section 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. § 303(r), and section 25.137(c) of the Federal Communication Commission's rules, 47 CFR § 25.137(c), as set forth in paragraphs 23-28 below.<sup>71</sup>

23. Any future grant of earth station licenses for operations with the OneWeb system will be subject to the following conditions:

- a. Communications between U.S.-licensed earth stations and OneWeb space stations must comport with all existing and future space station coordination agreements reached between the United Kingdom and other administrations. In the absence of a coordination agreement, such communications must comport with applicable provisions of the ITU Radio Regulations.
- b. In the 11.7-12.2 GHz (space-to-Earth) frequency band reception is permitted for transmissions up to the power flux-density limits in Article 21 of the ITU Radio Regulations, and up to the equivalent power flux-density requirements of 47 CFR § 25.208(g), (i), and (j).
- c. In the 12.2-12.7 GHz (space-to-Earth) frequency band reception is permitted for transmissions up to the power flux-density limits in 47 CFR § 25.208(o) and Article 21 of the ITU Radio Regulations, and up to the equivalent power flux-density requirements of 47 CFR § 25.208(l); Earth Stations on Vessels (ESV), Vehicle-Mounted Earth Stations (VMES), and Earth Stations Aboard Aircraft (ESAA) shall not claim protection from transmissions of non-Federal stations in the fixed service.
- d. In the 14.0-14.5 GHz (Earth-to-space) frequency band reception is permitted for levels up to the equivalent power flux-density requirements of 47 CFR § 25.208(k).
- e. In the 10.7-11.7 GHz (space-to-Earth) frequency band reception is permitted for transmissions up to the applicable power flux-density limits in 47 CFR § 25.208(b), and up to the equivalent power flux-density requirements of 47 CFR § 25.208(g), (i) and (j).
- f. Waiver of the United States Table of Frequency Allocations, 47 CFR § 2.106, IS GRANTED. Communications in the 17.8-18.6 GHz (space-to-Earth) frequency band are on a non-conforming basis. Such communications are on an unprotected basis and operations must immediately terminate upon notification of harmful interference. In addition, such communications must comport with the applicable power flux-density limits in Article 21 of the ITU Radio Regulations and 47 CFR § 25.208(c), and equivalent power flux-density requirements in Article 22 of the ITU Radio Regulations.

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<sup>71</sup> Given the lack of ambiguity of these conditions, as well as the requirement that licensees abide by our rules absent a waiver, we believe it is unnecessary to include the boilerplate language requested by O3b that operations with the OneWeb system "must be in accordance with the terms, conditions, and technical specifications set forth in OneWeb's application," in its petition and in those Commission rules not waived herein. *See O3b Ex Parte*, Appx.

- g. In the 18.8-19.3 GHz (space-to-Earth) frequency band reception is permitted for transmissions up to the power flux-density limits in 47 CFR § 25.208(e).
- h. In the 27.5-28.6 GHz and 29.5-30 GHz (Earth-to-space) frequency bands transmission is permitted at levels up to the applicable equivalent power flux-density requirements of Article 22 of the ITU Radio Regulations.<sup>72</sup>
- i. Transmissions in the 27.5-28.35 GHz (Earth-to-space) frequency band are secondary with respect to Upper Microwave Flexible Use Service (UMFUS) operations, except for FSS operations associated with earth stations authorized pursuant to 47 CFR § 25.136.
- j. Transmissions in the 28.35-28.6 GHz and 29.5-30 GHz (Earth-to-space) frequency bands are on a secondary basis with respect to GSO FSS operations.
- k. Operations must comply with the avoidance of in-line interference method specified in 47 CFR § 25.261(b)-(d) with respect to any NGSO system licensed or granted U.S. market access pursuant to the processing round initiated in Public Notice, DA 16-804.<sup>73</sup>
24. Any future grant of earth station licenses for operations with the OneWeb system will be subject to the following conditions, unless such conditions are satisfied prior to such license grant:
- a. In the 14.47-14.5 GHz band, operations are subject to footnote US342 to the U.S. Table of Frequency Allocations, 47 CFR § 2.106, and all practicable steps must be taken to protect the radio astronomy service from harmful interference.
- b. In the 10.7-11.7 GHz band, operations must be coordinated with the radio astronomy observatories listed in 47 CFR § 2.106, n.US131, to achieve a mutually acceptable agreement regarding the protection of the radio telescope facilities operating in the 10.6-10.7 GHz band.
- c. Space-to-Earth operations in the 17.8-18.6 GHz and 18.8-19.3 GHz bands must complete coordination with U.S. Federal systems, in accordance with footnote US334 to the United States Table of Frequency Allocations, 47 CFR § 2.106, prior to being used. The use of space-to-Earth operations in the 17.8-18.6 GHz and 18.8-19.3 GHz bands must be in accordance with the signed coordination agreement between OneWeb and U.S. Federal operators. Two weeks prior to the start of any operations in the 17.8-18.6 GHz and 18.8-19.3 GHz bands, OneWeb must provide to the Federal user, Jimmy Nguyen, Email: [Jimmy.Nguyen@us.af.mil](mailto:Jimmy.Nguyen@us.af.mil), contact information for a 24/7 point of contact for the resolution of any harmful interference.
- d. Prior to initiation of service, OneWeb must receive a favorable or “qualified favorable” finding in accordance with Recommendation 85 (WRC-03) with respect to its compliance with applicable EPFD limits in Article 22 of the ITU Radio Regulations.

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<sup>72</sup> We decline to incorporate ViaSat’s recommended modifications to this language, and note that incorporation of these ITU EPFD limits into the Commission rules has been proposed in the NGSO FSS NPRM and is currently under consideration within that proceeding. We further note that neither the ITU Radio Regulations nor the Commission’s rules contain aggregate EPFD limits in frequency bands allocated to the FSS for Earth-to-space (uplink) transmissions. This matter was raised in comments to the NGSO FSS NPRM, which proposed single entry limits for uplink and downlink operators and aggregate limits for downlinks, per the ITU limits, and is also under consideration. *See June 13 ViaSat Ex Parte*, Exh. A at 13.

<sup>73</sup> We decline O3b’s request to insert specific text in this paragraph providing, at this stage, for equal sharing between its space stations with a market access grant and satellite systems licensed or granted market access in the processing round. *O3b Ex Parte*, Appx. As drafted, this condition could apply to portions of a satellite system granted prior to the processing round, if that system is modified in the processing round and the Commission determines that equivalent treatment for all satellites in the system would serve the public interest. The status of O3b’s obligations in operating its NGSO FSS space stations that currently have a market access grant will be determined when the Commission acts on O3b’s current petition for market access within the processing round.

e. At least ninety days prior to the initiation of service to the public, OneWeb must submit in File No. SAT-LOI-20160428-00041:

i. a comprehensive technical showing for its NGSO FSS system in the 10.7-12.2 GHz frequency band, in accordance with 47 CFR § 25.146(b).

ii. a technical showing for its NGSO FSS system in the 12.2-12.7 GHz frequency band, in accordance with 47 CFR § 25.146(g).

iii. a comprehensive technical showing for its NGSO FSS system in the 17.8-18.6 GHz frequency band, to demonstrate that the NGSO FSS system is expected not to operate in excess of the additional operational EPFD<sub>down</sub> limits and the operational EPFD<sub>down</sub> limits specified in the applicable equivalent power flux-density requirements of Article 22 of the ITU Radio Regulations.

f. Prior to initiation of service, OneWeb must obtain from the United Kingdom Space Agency an authorization for deployment and space operations under the United Kingdom Outer Space Act. OneWeb must file evidence in File No. SAT-LOI-20160428-00041 demonstrating grant of any such authorizations within five business days of action by the United Kingdom Space Agency. Thereafter, this grant will remain effective only to the extent that launch and space operations continue to be authorized by the United Kingdom Space Agency under the United Kingdom Outer Space Act.

25. Any future grant of earth station licenses for operations with the OneWeb system may be withheld, subjected to additional conditions, or modified, if the following conditions are not met:

a. OneWeb must cooperate with other NGSO FSS operators in order to ensure that all authorized operations jointly comport with the applicable limits for aggregate EPFD in the space-to-Earth direction (EPFD<sub>down</sub>) contained in 47 CFR § 25.208(h), (m), as well as in Resolution 76 of the ITU Radio Regulations.<sup>74</sup>

b. OneWeb must maintain an electronic web site bulletin board listing the ephemeris data for each satellite in the constellation, using the North American Aerospace Defense Command (NORAD) two-line orbital element format. The orbital elements must be updated at least once every three days.

c. Satellite operations must be subject to direct and effective regulation by the United Kingdom concerning orbital debris mitigation.

d. OneWeb must coordinate physical operations of spacecraft with any operator using similar orbits, for the purpose of eliminating collision risk and minimizing operational impacts. The orbital parameters specified in this grant are subject to change based on such coordination.

26. This grant of U.S. market access and any earth station licenses granted in the future are subject to modification to bring them into conformance with any rules or policies adopted by the Commission in the future.

27. This declaratory ruling does not address the provision of any Direct-to-Home (DTH) service, Direct Broadcast Satellite Service (DBS)<sup>75</sup> or Digital Audio Radio Service (DARS) to, from, or within the United States.

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<sup>74</sup> Instead of deleting this condition, as proposed by ViaSat, the text was modified to clarify its intent. See *June 13 ViaSat Ex Parte*, Exh. A at 15. We also decline O3b's request to insert an additional sentence in this paragraph, as the existing provision already covers the point raised by O3b. *O3b Ex Parte*, Appx.

<sup>75</sup> With respect to DBS and DTH, this paragraph excludes from the scope of the grant those services specified in 47 CFR § 25.701(a)(1)-(5).

28. IT IS FURTHER ORDERED that this grant is subject to the following requirements:

OneWeb must post a surety bond in satisfaction of 47 CFR §§ 25.165(a)(1) & (b) no later than **July 24, 2017**, and thereafter maintain on file a surety bond requiring payment in the event of a default in an amount, at minimum, determined according to the formula set forth in 47 CFR § 25.165(a)(1); and

OneWeb must launch the space stations, place them in the assigned orbits, and operate them in accordance with the station authorization no later than **June 22, 2023**, 47 CFR § 25.164(b).

This grant of U.S. market access will be null and void automatically, without further Commission action if OneWeb fails to comply with any of these requirements. Failure to comply with the milestone requirement of 47 CFR § 25.164(b) will also result in forfeiture of OneWeb's surety bond. By **July 7, 2023**, OneWeb must either demonstrate compliance with its milestone requirement or notify the Commission in writing that the requirement was not met. 47 CFR § 25.164(f).

29. IT IS FURTHER ORDERED that based on the spectrum sharing opportunities provided by Paragraph 23(k) above, which presumes grants on a co-frequency basis with other satellite systems, the request for waiver of the band segmentation provision in 47 CFR § 25.157(e) IS GRANTED.

30. IT IS FURTHER ORDERED that OneWeb's request for waiver of the source code requirements in 47 CFR § 25.146(a)(1)(iii), (2)(iii), IS GRANTED.

31. IT IS FURTHER ORDERED that the request for waiver of 47 CFR § 25.202(a)(1), n.6, restricting use of the 10.7-11.7 GHz band by non-geostationary-satellite orbit (NGSO) fixed-satellite service (FSS) systems to operations with gateway earth stations, IS DISMISSED without prejudice to re-filing in connection with such an application.

32. IT IS FURTHER ORDERED that the request for waiver of 47 CFR § 2.106, n.NG52, concerning geostationary-satellite operations in the 10.7-11.7 GHz band, IS DISMISSED as moot.

33. IT IS FURTHER ORDERED that the Petitions to Deny of Telesat Canada and the MVDDS 5G Coalition ARE GRANTED to the extent indicated herein, and are otherwise DENIED.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch  
Secretary

**STATEMENT OF  
CHAIRMAN AJIT PAI**

Re: *WorldVu Satellites Limited, Petition for a Declaratory Ruling Granting Access to the U.S. Market for the OneWeb NGSO FSS System.*

Humans have long sought inspiration from the stars, from the ancient Egyptians orienting the pyramids toward certain stars to the Greeks using constellations to write their mythology. In modern times, we've done the same, with over 1,000 active satellites currently in orbit. Today, the FCC harnesses that inspiration as we seek to make the promise of high-speed Internet access a reality for more Americans, partly through the skies.

Over a year ago, OneWeb was the first company to seek approval to enter the U.S. market with a system of high-capacity satellites that orbit closer to Earth than any satellite has ever before. The goal of this non-geostationary satellite orbit (NGSO) technology is to provide global, high-speed broadband service—and its use case is particularly compelling in remote and hard-to-serve areas.

Today, we grant OneWeb's petition for U.S. market access. OneWeb is leading the charge with its planned constellation of 720 satellites, and others are close behind. After OneWeb filed its petition, several other companies did the same or applied for a U.S. license in the same spectrum bands. These applications are being reviewed by the International Bureau's excellent satellite engineering experts. We hope to approve many more constellations because we know that the more companies compete, the more consumers win. Additionally, the Commission also has an ongoing rulemaking proceeding proposing to update the current NGSO Fixed Satellite Service rules to better accommodate this next generation of systems.

But first things first. This *Order* lays the foundation for deployment of future low-Earth orbit satellites while establishing carefully measured standards to ensure that these NGSO constellations will not interfere with their terrestrial or geostationary counterparts. And the *Order* provides that OneWeb will need to accommodate in-line interference avoidance and spectrum sharing with other NGSOs in the future.

Many thanks to Jose Albuquerque, Christopher Bair, Clay DeCell, Stephen Duall, Chip Fleming, Jennifer Gilson, Karl Kensinger, Kal Krautkramer, Kathryn Medley, Tom Sullivan, and Troy Tanner in the International Bureau; Nicholas Oros and Jamison Prime in the Office of Engineering and Technology; Peter Daronco, Nese Guendelsberger, Matthew Pearl, Blaise Scinto, and Joel Taubenblatt from the Wireless Telecommunications Bureau; and Deborah Broderon and David Horowitz from the Office of General Counsel. Thousands of years ago, people looked to the stars to predict their destiny. In the future, thanks to your efforts, we hope that Americans will be able to use these networks in the sky to make their own destiny.

**STATEMENT OF  
COMMISSIONER MIGNON L. CLYBURN**

Re: *WorldVu Satellites Limited, Petition for a Declaratory Ruling Granting Access to the U.S. Market for the OneWeb NGSO FSS System.*

Many of you have heard me talk about the powerful effects of a pilot project involving diabetic patients in Ruleville, Mississippi. Thanks to the combined forces of a tablet and broadband access, after year one, none of the participating patients had hospital visits, resulting in a \$339,000 savings in that state's Medicaid spending. Initiatives such as this, which improve health outcomes and saves dollars, are most often of greatest need in the very communities that lack the preeminent game changer of our time: access to broadband, and not just the infrastructure which enables broadband, but broadband services that people can afford.

The persistent challenge of bridging the digital and opportunities divide, is why I am excited to see OneWeb and other satellite companies embark on the laudable quest to provide ubiquitous and affordable advanced communications services.

Satellites are an integral part of our lives, but they are often taken for granted. Satellites provide support to the Department of Defense (DoD), the Federal Emergency Management Agency (FEMA), the National Aeronautics and Space Administration (NASA), as well as emergency services in our local communities. They are used to support GPS systems, essential in our travel needs, and they allow weather services to alert us when we need an umbrella for our morning commute. And now, advancements in technology and reductions in manufacturing and launching costs have propelled innovation, and promise to usher in a new era of competitive broadband offerings from satellite companies.

As I stated during last year's #Solutions2020 Policy Forum, we must maintain a laser focus on finding solutions for those who lack access to the communications services needed for today's connected world. The proposals offered by OneWeb and others participating in this NGSO FSS processing round offer us an opportunity, once again, to pivot away from simply discussing the problem to finding solutions.

Congratulations to Tom Sullivan on your appointment to permanent Bureau Chief. I would like to thank you, Jose Albuquerque, and the staff of the International Bureau for your work on this important item. I look forward to continuing to work with you and my colleagues as we strive to create a more digitally inclusive society while enabling a space for more innovation and competition in the communications sector.

**STATEMENT OF  
COMMISSIONER MICHAEL O'RIELLY**

Re: *WorldVu Satellites Limited, Petition for a Declaratory Ruling Granting Access to the U.S. Market for the OneWeb NGSO FSS System.*

There has been much excitement about the next generation non-geostationary-satellite orbit (NGSO) systems. If all the differing visions materialize, they will facilitate high-speed broadband connectivity to the hardest to reach portions of our country, enabling the offering of service to the unserved. A few question marks do remain. For instance, these systems are incredibly ambitious, involving a scale of satellite deployments we have not seen before. OneWeb's system calls for more than 700 satellites and another entity, with a pending application, seeks to launch more than 4000 satellites. And, some of the NGSO systems planned in the V-band are even larger. Will some of these systems come to fruition? More than likely. Will all of these systems be launched? That seems like a stretch. Will we facilitate the development of next generation technologies and let the market and American consumer determine their success or failure? That should certainly be our directive. For this reason, I generally support today's order.

However, those who read today's item will be quick to notice that the scope of these systems has raised many issues, such as preventing in-line interference and orbital debris, which will need to be considered further. There are also multiple conditions on OneWeb's approval. For example, access to some frequencies could be restricted by future Multichannel Video Distribution and Data Service (MVDDS) proceedings and our action today is conditioned on the outcome of the larger NGSO rulemaking. This item highlights what needs to be addressed and, with any luck, we will resolve these proceedings as quickly as possible. Hopefully, our action today will provide NGSO applicants some level of certainty, permitting them to obtain investment and make future plans, but this item is more like a first step rather than the middle or final one.

Going forward, there should be a more holistic conversation and appropriate consideration of the complete picture of spectrum needs for both NGSOs and terrestrial use. As I have stated before, the satellite and wireless industries continue on a collision course, both here and internationally, as they seek spectrum for future systems. Generally, I remain concerned that we may be overlooking and foregoing opportunities for the clearing or sharing of spectrum by permitting additional uses on a piecemeal basis.