

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

In the Matter of )
Telesat Canada ) IBFS File No. SAT-PDR-20161115-00108
Petition for Declaratory Ruling to Grant Access to ) Call Sign S2976
the U.S. Market for Telesat’s NGSO Constellation )

ORDER AND DECLARATORY RULING

Adopted: November 2, 2017

Released: November 3, 2017

By the Commission:

I. INTRODUCTION

1. In this Order and Declaratory Ruling, we grant the request of Telesat Canada (Telesat) 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 117 satellites authorized by Canada. In granting this request, we address concerns expressed by commenters seeking various conditions on the grant and partially deny one Petition to Deny. This grant of market access for a non-geostationary-satellite orbit, fixed-satellite service (NGSO FSS) system 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 and will enhance competition among existing and future FSS satellite systems.

II. BACKGROUND

2. Petition. On November 15, 2016, Telesat filed a petition for declaratory ruling seeking access to the U.S. market for a proposed NGSO FSS satellite system. The proposed Telesat system

1 Telesat Canada, Petition for Declaratory Ruling to Grant Access to the U.S. Market for Telesat’s NGSO Constellation, IBFS File No. SAT-PDR-20161115-00108 (filed Nov. 15, 2016) (Telesat Petition). Although the Telesat Petition was originally filed as IBFS File No. SAT-LOI-20161115-00108, the Commission made an administrative change to the IBFS file number from a Letter of Intent (LOI) to a Petition for Declaratory Ruling (PDR) to reflect the nature of Telesat’s request. Telesat provided corrected values for the planned right ascension of the ascending node (RAAN) in an erratum. See Letter from Elisabeth Neasmith, Director, Spectrum Management and Development, Telesat Canada, to Jose P. Albuquerque, Chief, Satellite Division, International Bureau, FCC (filed July 7, 2017) (Telesat Erratum).

2 47 U.S.C. § 151; Telesat Petition, Narrative at 5.

3 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. 184-88 (1997) (1997 Report (continued....))

consists of a constellation of 117 satellites in 11 orbital planes, with 6 planes (12 satellites per plane) inclined 99.5 degrees in a circular orbit at an approximate altitude of 1000 kilometers and 5 planes (9 satellites per plane) inclined 37.4 degrees in a circular orbit at an approximate altitude of 1248 kilometers.<sup>4</sup> The satellites are authorized by Canada and will operate in the 17.8-18.6 GHz (space-to-Earth), 18.8-19.3 GHz (space-to-Earth), 19.7-20.2 GHz (space-to-Earth), 27.5-29.1 GHz (Earth-to-space), and 29.5-30.0 GHz (Earth-to-space) frequency bands.<sup>5</sup> In its Petition, Telesat sought certain waivers of the Commission's rules.<sup>6</sup>

3. *Processing Rounds.* On July 15, 2016, the Commission accepted for filing the petition for declaratory ruling of WorldVu Satellites Limited, d/b/a/ OneWeb (OneWeb).<sup>7</sup> At the same time that the Commission accepted OneWeb's Petition for filing, it initiated a processing round for additional NGSO-like applications and petitions in the frequency bands requested by OneWeb.<sup>8</sup> The processing round closed on November 15, 2016. Eleven additional applications and petitions were filed for NGSO-like satellite systems, including the petition filed by Telesat.<sup>9</sup> On May 26, 2017, the Telesat Petition was accepted for filing, and at the same time a second processing round was initiated for the additional frequency bands requested by Telesat and other applicants and petitioners.<sup>10</sup> The second processing round closed on July 26, 2017 with two additional applications received.<sup>11</sup> Each of these applicants and petitioners proposes an NGSO FSS system that, if approved, would have the same status and the same rights as other participants in the same processing round, including in any division of frequencies that may be required to avoid mutual interference.<sup>12</sup> On June 22, 2017, the Commission adopted an order

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*and Order*). In addition to the present petition, Telesat must file and the Commission must approve corresponding earth station applications before Telesat may provide its proposed services in the United States.

<sup>4</sup> Telesat Petition, Technical Exhibit at 1.

<sup>5</sup> *Id.* at 5.

<sup>6</sup> Telesat Petition, Narrative at 31-33.

<sup>7</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 Rcd 7666 (IB 2016).

<sup>8</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>9</sup> See IBFS File Nos. SAT-MOD-20160624-00060 and SAT-AMD-20161115-00116 (O3b Limited); 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>10</sup> *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). The application of Kepler Communications Inc. was accepted for filing in a subsequent public notice. See Satellite Policy Branch Information: Space Station Applications Accepted for Filing, Public Notice, Report No. SAT-01259 (IB rel. Aug. 11, 2017).

<sup>11</sup> See IBFS File Nos. SAT-LOA-20170726-00110 (Space Exploration Holdings, LLC); SAT-LOI-20170726-00111 (New Spectrum Satellite, Ltd).

<sup>12</sup> See *WorldVu Satellites Limited, Petition for Declaratory Ruling Granting Access to the U.S. Market for the OneWeb NGSO FSS System*, Order and Declaratory Ruling, 32 FCC Rcd 5366, 5371-72, para. 11 (2017) (*OneWeb Order*).

granting with conditions the OneWeb petition (*OneWeb Order*).<sup>13</sup>

4. *Comments.* ViaSat, Inc. (ViaSat) filed a petition to deny the Telesat Petition unless certain conditions are imposed on the grant.<sup>14</sup> SES S.A. and O3b Limited (SES and O3b) requested that any grant of the Telesat Petition be subject to the same conditions that were placed on the grant of U.S. market access for the O3b NGSO FSS system and OneWeb.<sup>15</sup> SES and O3b also requested that grant be based on compliance with international aggregate equivalent power flux-density (EPFD) requirements, questioned the sufficiency of Telesat's EPFD demonstrations, and requested that the Commission clarify the relationship between ITU filing priority and spectrum sharing for NGSO systems.<sup>16</sup> Spire Global (Spire) requested that Telesat provide more information on its orbital debris mitigation plans including how it would avoid collisions with or operational impacts on Spire's NGSO system during deorbit of the Telesat satellites.<sup>17</sup> Space Norway AS (Space Norway) requested that Telesat be required to provide the same protection to highly elliptical orbit satellite systems as is afforded to geostationary-orbit satellites.<sup>18</sup> OneWeb requested that the Commission impose a separation zone between the operating altitudes of its NGSO constellation and Telesat's.<sup>19</sup> OneWeb also questioned Telesat's orbital debris showing, noted errors in the right ascension of the ascending node values provided in Telesat's Schedule S that could impact Telesat's ability to satisfy domestic geographic coverage requirements, and questioned the sufficiency of Telesat's EPFD showings.<sup>20</sup> Space Exploration Technologies Corp. (SpaceX) expressed concerns about the high earth station equivalent isotropically radiated power (EIRP) levels used in the Telesat system and other proposed systems and the potential for inefficient spectrum use based on the design of the Telesat system.<sup>21</sup> Hughes Network Systems, LLC (Hughes) requested generally that the Commission require NGSO FSS applicants and petitioners to provide more information on compliance with EPFD limits prior to grant to ensure the protection of GSO systems and partially supported the ViaSat Petition to Deny.<sup>22</sup> Telesat opposed the petition to deny and responded to the comments.<sup>23</sup>

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<sup>13</sup> *OneWeb Order*, 32 FCC Rcd at 5366, para 1.

<sup>14</sup> ViaSat, Inc. Petition to Deny (filed June 26, 2017) (ViaSat) (requesting that Commission condition grant on compliance with the outcome of future rulemakings, limit operations to the parameters specified in the application rather than the limits of what the rules permit, and impose several conditions related to aggregate interference); ViaSat Reply (filed July 14, 2017).

<sup>15</sup> SES S.A. and O3b Limited Comments at 8-10 (filed June 26, 2017) (SES and O3b).

<sup>16</sup> *Id.* at 3-8; SES and O3b Reply (filed July 26, 2017).

<sup>17</sup> Spire Global, Inc. Comments at 3-5 (filed June 26, 2017) (Spire). Spire also requested that Telesat's grant be conditioned on submission of a final orbital debris plan and on compliance with the outcome of future rulemakings. *Id.* at 5.

<sup>18</sup> Space Norway AS Comments at 2 (filed June 26, 2017) (Space Norway).

<sup>19</sup> WorldVu Satellites Limited Comments at 2-3 (filed June 26, 2017) (OneWeb).

<sup>20</sup> *Id.* at 3-9; OneWeb Reply (filed July 14, 2017).

<sup>21</sup> Space Exploration Technologies Corp. Comments (filed June 26, 2017) (SpaceX); SpaceX Reply (filed July 14, 2017).

<sup>22</sup> Hughes Network Systems, LLC Comments at 2-3 (filed June 26, 2017) (Hughes); Hughes Reply at 2 (filed July 7, 2017). Hughes also requested that grant be conditioned on compliance with future rulemakings. Hughes Comments at 2.

<sup>23</sup> Telesat Opposition to ViaSat Petition to Deny (filed July 7, 2017); Telesat Response to Hughes Comments (filed July 7, 2017); Telesat Response to SpaceX Comments (filed July 7, 2017); Telesat Response to Spire Comments (filed July 7, 2017); Telesat Response to SES and O3b Comments (filed July 7, 2017); Telesat Response to Space Norway Comments (filed July 7, 2017); Telesat Response to OneWeb Comments (filed July 7, 2017). Telesat also filed an *ex parte* after the end of the comment period to respond to issues raised in OneWeb's reply comments. *See*

(continued...)

### III. DISCUSSION

5. After review of the record, we conclude that grant of the Telesat Petition will serve the public interest, subject to the requirements and conditions specified herein.<sup>24</sup> Our public interest analysis considers the effect of the proposed Telesat 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>25</sup> Below, we address the various outstanding issues raised by commenters on the Petition. We also address Telesat's waiver requests. Where appropriate, we defer matters of general applicability to ongoing or potential future rulemakings.

6. *ITU Coordination.* SES and O3b suggest that we clarify in any grant of market access to Telesat that the priority of ITU filings is not relevant to the Commission's expectations regarding spectrum sharing among NGSO systems authorized to serve the U.S. market.<sup>26</sup> We note that Telesat filed petitions to deny against the other participants in the NGSO FSS processing rounds requesting, *inter alia*, that any grant of those applications or petitions be conditioned on compliance with the ITU Radio Regulations which require certain coordination procedures among NGSO operators.<sup>27</sup> We recently declined to adopt Telesat's proposal to award priority according to ITU filing dates,<sup>28</sup> and deny Telesat's petition in so far as it reiterates Telesat's ITU filing date priority proposal. Accordingly, we address SES and O3b's concerns by including a condition requiring Telesat to comply with the spectrum sharing requirements specified in section 25.261 of the Commission's rules with respect to any other NGSO system licensed or granted U.S. market access pursuant to the processing rounds in which Telesat participated.<sup>29</sup> We recently adopted changes to section 25.261 that replaced the avoidance of in-line interference methodology for triggering spectrum division (absent coordination) with a default spectrum splitting sharing mechanism that is triggered when the change in system noise temperature caused by interference, or  $\Delta T/T$ , exceeds a threshold of 6 percent.<sup>30</sup> Additionally, we include a condition, which

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Letter from Elisabeth Neasmith, Director, Spectrum Management and Development, Telesat Canada, to Jose P. Albuquerque, Chief, Satellite Division, International Bureau, FCC (filed Aug. 3, 2017).

<sup>24</sup> *1997 Report and Order*, 12 FCC Rcd at 24106, para. 29.

<sup>25</sup> *Id.* Except as otherwise discussed herein, we conclude that the Telesat Petition satisfies these basic requirements for U.S. market access.

<sup>26</sup> SES and O3b Comments at 6-7. By "filing priority" we understand SES and O3b's comments to refer to the date order in which coordination requests are filed with the ITU. Pursuant to the ITU's regulations, it is incumbent upon an operator with the later filing to initiate coordination with operators with earlier filings. See 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 the [coordination] difficulties, in a manner acceptable to the parties concerned").

<sup>27</sup> See, e.g., Telesat Petition to Deny Space Norway at 3-4 (filed June 26, 2017) (available in IBFS File No. SAT-PDR-20161115-00111); Telesat Petition to Deny Audacy at 3-4 (filed June 26, 2017) (available in IBFS File No. SAT-LOA-20161115-00117).

<sup>28</sup> *Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters*, Report and Order and Further Notice of Proposed Rulemaking, FCC 17-122, para. 50 (Sept. 27, 2017) (*NGSO FSS Order* or *NGSO FSS FNPRM*). The rules adopted in this proceeding will go into effect 30 days after publication of the Report and Order in the Federal Register, except that those amendments which contain new and modified information collection requirements that require approval by the Office of Management and Budget under the Paperwork Reduction Act will become effective after the Commission publishes a notice in the Federal Register announcing such approval and the relevant effective date.

<sup>29</sup> *OneWeb Order*, 32 FCC Rcd at 5377, para. 23(k).

<sup>30</sup> *NGSO FSS Order* at 17, para. 49.

was also included in the *OneWeb Order*, requiring compliance with the ITU Radio Regulations.<sup>31</sup>

7. *Geographic Coverage Requirements.* OneWeb noted certain errors in the right ascension of the ascending node (RAAN) values in Telesat's Schedule S that would result in Telesat failing to meet domestic geographic coverage requirements.<sup>32</sup> Telesat responded by recognizing the errors and filing a supplement including the correct RAAN values for its system.<sup>33</sup> In its reply comments, OneWeb continued to question Telesat's ability to satisfy the domestic geographic coverage requirements and suggested that the Commission request a more detailed showing of compliance from Telesat or have Telesat request a waiver of the domestic coverage rule.<sup>34</sup>

8. We deny OneWeb's request. The domestic geographic coverage rule requires, *inter alia*, that an applicant certify that its proposed system will be able to provide continuous FSS throughout the fifty states, the U.S. Virgin Islands, and Puerto Rico.<sup>35</sup> Telesat certified compliance with this rule in its application.<sup>36</sup> Although OneWeb provided an analysis in its comments questioning Telesat's ability to comply with the coverage requirement in the 19.7-20.2 GHz frequency band, OneWeb provided no analysis with regard to Telesat's ability to provide continuous domestic FSS in any of the other downlink bands in which Telesat intends to operate, such as the 17.8-18.6 GHz, 18.8-19.3 GHz frequency bands. Consequently, we have no reason to question Telesat's certified compliance with the rule.

9. *EPFD Analysis.* Several commenters suggested that the EPFD analysis provided by Telesat is insufficient and that the Commission should request a supplemental EPFD analysis.<sup>37</sup> We disagree. While section 25.146 of the Commission's rules requires specific EPFD showings from NGSO FSS applicants, including the use of ITU software, in certain portions of the Ku-band,<sup>38</sup> we note that no comparable requirement exists in Part 25 for the Ka-band frequencies requested by Telesat.<sup>39</sup> We find that Telesat's demonstrations in its Petition and associated filings are sufficient to justify this grant of market access. However, to ensure that Telesat will satisfy its EPFD obligations going forward, we condition this grant on Telesat receiving a favorable or "qualified favorable" finding of its EPFD demonstration from the ITU prior to initiation of service.<sup>40</sup> Review by the ITU of Telesat's compliance

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<sup>31</sup> *OneWeb Order*, 32 FCC Rcd at 5376, 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. Compliance with the ITU Radio Regulations 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>32</sup> OneWeb Comments at 7-9. See 47 CFR § 25.145(c).

<sup>33</sup> Telesat Response to OneWeb Comments at 19-23; Telesat Erratum.

<sup>34</sup> OneWeb Reply at 6-7.

<sup>35</sup> 47 CFR § 25.145(c)(2) (requiring that "the proposed system is capable of providing Fixed-Satellite Service on a continuous basis throughout the fifty states, Puerto Rico, and the U.S. Virgin Islands"). We note that a Further Notice of Proposed Rulemaking was recently issued that includes a proposal to eliminate this domestic coverage requirement for NGSO FSS systems. *NGSO FSS FNPRM at 25-26*, paras. 73-76.

<sup>36</sup> Telesat Petition, Technical Exhibit at 23-25.

<sup>37</sup> See SES and O3b Comments at 4; SES and O3b Reply at 2-5; OneWeb Comments at 3-6; Hughes Comments at 2-3.

<sup>38</sup> 47 CFR § 25.146.

<sup>39</sup> 47 CFR § 25.145.

<sup>40</sup> As in the *OneWeb Order*, we also require that Telesat provide a showing of compliance with a different set of EPFD limits 90 days prior to the initiation of service.

with ITU EPFD limits in the Ka-band, using methods now approved by the ITU,<sup>41</sup> will provide assurances that Telesat will comply with the Ka-band EPFD limits specified in Article 22 of the Radio Regulations beyond the other technical demonstrations that Telesat has already provided.

10. In addition, as a condition to this grant of U.S. market access, Telesat must communicate the ITU finding to the Commission and submit the files containing the data used as input to the ITU validation software.<sup>42</sup> We find such a requirement satisfies the concerns of GSO FSS operators who request verification, either by the Commission or third parties, of the complete set of input information used for the EPFD showing to the ITU.<sup>43</sup> Submission of the data input files used for the ITU validation of Article 22 limits will allow such verification, either by the Commission or third-parties.

11. As in the *OneWeb Order*, we are permitting Telesat to operate up to the PFD and EPFD levels specified in applicable regulations, rather than the specific demonstrations in its application. We find this flexibility is warranted given the preliminary nature of the system design, the fact that this grant is conditioned on Telesat's satisfaction of the ITU's EPFD assessment and the condition that Telesat cooperate with other NGSO operators to meet limits for aggregate EPFD. We therefore reject ViaSat's arguments that Telesat should be limited to the levels used in the EPFD demonstration in its application and deny this portion of ViaSat's Petition to Deny.<sup>44</sup>

12. *Buffer Zone and Orbital Debris.* To avoid collisions with OneWeb satellites, OneWeb requested that any grant of market access to Telesat be conditioned on Telesat maintaining "an approximate 125 [kilometer] altitude buffer zone (the "Safety Buffer Zone") between its constellation and other NGSO systems," including OneWeb's own NGSO system, subject to coordination.<sup>45</sup> As a preliminary matter, the scope of OneWeb's request is unclear and could be interpreted to request a buffer zone that spans altitudes between 1015 and 1385 kilometers. While we are concerned about the risk of collisions between the space stations of NGSO systems operating at similar orbital altitudes, we think that these concerns are best addressed in the first instance through inter-operator coordination. At this stage, we do not think it appropriate to specify the methods for effecting coordination, which may involve a wide range of changes in system design and operations. Furthermore, as both the OneWeb and Telesat systems are authorized by other administrations, we decline at this stage to specify a solution to an issue for which those administrations will bear primary responsibility. Telesat will be subject to the same condition requirements as OneWeb,<sup>46</sup> including coordination of its physical operations with space stations of NGSO systems operating at similar orbital altitudes. To the extent that Telesat and other NGSO operators fail to come to an agreement regarding physical coordination, the Commission may intervene as appropriate.

13. An applicant for a space station authorization must submit a description of the design and operational strategies that it will use to mitigate orbital debris, including a statement detailing post-mission disposal plans for space stations at the end of their operating life.<sup>47</sup> Telesat provided a

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<sup>41</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>.

<sup>42</sup> *Id.* If the files have already been submitted to the Commission and do not need any update, then Telesat need not resubmit these files.

<sup>43</sup> *See, e.g.*, Letter from Susan H. Crandall, Associate General Counsel, Intelsat Corporation, to Marlene H. Dortch, Secretary, FCC, IB Docket No. 16-408 (filed Sept. 15, 2017) (stressing the importance of EPFD limits specified in Article 22 to protecting GSO satellites from harmful interference from NGSO systems).

<sup>44</sup> ViaSat Petition to Deny at 5-8.

<sup>45</sup> OneWeb Comments at 2-3.

<sup>46</sup> *OneWeb Order*, 32 FCC Rcd 5378, para. 25(d).

<sup>47</sup> *Mitigation of Orbital Debris*, 19 FCC Rcd 11567, 11619; 47 CFR §25.114(d)(14).

preliminary orbital debris mitigation analysis as part of its Petition.<sup>48</sup> On June 26, 2017, Spire filed comments on Telesat's Petition arguing that: (1) more information is needed regarding Telesat's post-mission disposal plans through atmospheric re-entry so that existing operators can assess the risk created by Telesat's system, (2) systems without final designs, including Telesat's system, should be required through a grant condition to submit an updated orbital debris mitigation plan once its system design is finalized, and (3) the Commission should condition Telesat's grant of market access on the outcome of future rulemakings.<sup>49</sup> OneWeb also questioned the adequacy of Telesat's orbital debris showing and requested that Telesat be required to provide more information on a number of specific points.<sup>50</sup>

14. Telesat indicates that its debris mitigation plan is a preliminary assessment pending the final constellation design, and we note that there have been modifications to that plan over time.<sup>51</sup> Accordingly, we condition grant of the Telesat Petition on Telesat presenting and the Commission granting a modification of this market access grant to include a final orbital debris mitigation plan.<sup>52</sup> The modification should include, among other things, a discussion of any steps that Telesat has taken to coordinate physical operations with authorized and proposed NGSO systems at similar orbital altitudes (both for the main mission and disposal phases); a discussion of the level of data-sharing that would be required with other operators, including analysis of likely requirements for ephemeris refresh rates and time frames for coordination of planned maneuvers (both for the main mission and disposal phases); and whether Telesat has considered alternative orbital altitudes for its operations and whether those altitudes would materially affect Telesat's ability to provide service.<sup>53</sup>

15. *Matters Broadly Applicable to NGSO FSS Applications.* SpaceX suggests in its comments that the Commission consider conditions of grant that would promote efficient spectrum sharing among operators.<sup>54</sup> Hughes urges the Commission to adopt mechanisms for ensuring that aggregate EPFD limits are met by all NGSO systems authorized in the United States.<sup>55</sup> ViaSat questions the sufficiency of the EPFD limits proposed by the Commission to protect GSO systems from harmful interference and requests that each NGSO operator be held jointly and severally liable for harmful interference caused to GSO systems until the Commission adopts adequate aggregate EPFD limits and enforcement mechanisms.<sup>56</sup> Space Norway requests that Telesat's grant of market access be conditioned on Telesat's implementation of mechanisms to avoid in-line interference with highly elliptical orbit NGSO systems, such as that proposed by Space Norway.<sup>57</sup>

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<sup>48</sup> Telesat Petition, Technical Exhibit at 30-32.

<sup>49</sup> Spire Comments at 3-5. Spire's request that Telesat's grant be conditioned on the outcome of future rulemakings is addressed below. *See infra* para. 16.

<sup>50</sup> OneWeb Comments at 3-6. *See also* Telesat Response to Spire at 2-5; Telesat Response to OneWeb at 7-15; OneWeb Reply at 7-8.

<sup>51</sup> Letter from Elisabeth Neasmith, Director, Spectrum Management and Development, Telesat Canada, to Jose P. Albuquerque, Chief, Satellite Division, International Bureau, FCC (filed Apr. 14, 2017); Telesat Response to OneWeb at 9-15.

<sup>52</sup> The International Bureau has previously required applicants to file a modification application including updated orbital debris mitigation information in some instances. *See Northrop Grumman Space & Mission Systems Corp.*, Order and Authorization, 24 FCC Rcd 2330, 2363-64, para. 102 (IB 2009) (*Northrop Grumman Order*); *ContactMEO Communications, LLC*, Order and Authorization, 21 FCC Rcd 4035, 4052-53, para. 47 (IB 2006).

<sup>53</sup> In light of this condition, we do not reach a conclusion at this time as to whether Telesat has demonstrated that it is subject to direct and effective oversight by Canada concerning debris mitigation.

<sup>54</sup> SpaceX Comments at 5; SpaceX Reply at 7.

<sup>55</sup> Hughes Comments at 3.

<sup>56</sup> ViaSat Petition to Deny at 5, 8-9.

<sup>57</sup> Space Norway Comments at 2.

16. All of these comments relate to issues of general applicability that are more appropriately addressed in the context of a rulemaking. Several of these issues were already raised in an ongoing rulemaking proceeding concerning NGSO FSS matters<sup>58</sup> and addressed in a Report and Order adopted September 26, 2017.<sup>59</sup> Even if we agreed with commenters that it would be appropriate to address these concerns in conditions of grant, we do not think that the record is sufficiently developed in this proceeding on any of these points to support such conditions. SpaceX asks that we consider conditions that would promote efficient use of spectrum, but provides little guidance on what precisely it thinks that the Commission should do to promote such efficiency. Similarly, Hughes and ViaSat express concerns about international EPFD limits and aggregate EPFD enforcement mechanisms, but the record is not sufficiently developed to adopt any conditions and such concerns are more appropriately addressed in the context of a rulemaking proceeding at this time.<sup>60</sup> Space Norway's request for a condition requiring Telesat to protect the Space Norway NGSO system as though it were a GSO space station is in effect a request that the Commission reevaluate its licensing procedures with regard to an entire class of NGSO systems, i.e. those with highly-elliptical orbits. As indicated above, we defer consideration of such broadly applicable matters to that proceeding and other future rulemakings, and condition grant of the Telesat Petition on the outcome of such rulemaking proceedings, including the most recent NGSO FSS decision.<sup>61</sup> We note that, as with the *OneWeb Order*, grant of the Telesat Petition will not prejudice any decision, including a contrary action, in the ongoing NGSO FSS or other future rulemaking proceedings.<sup>62</sup> Rather, decisions of general applicability in such proceedings will be based on the totality of comments and proposals in those proceedings, including Telesat's.<sup>63</sup> Telesat will not receive any special exemptions to the rules adopted in any rulemaking based solely on this grant, should Telesat choose to accept it.<sup>64</sup>

17. *Conditions.* Below, we condition this grant of U.S. market access in response to comments and as warranted in the public interest. 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. To the extent that the Telesat Petition raises the same concerns as OneWeb, we impose substantially identical conditions on Telesat as we did in the *OneWeb Order*. In their comments, SES and O3b ask that we impose on any grant for the Telesat system the same conditions that were imposed on O3b's NGSO FSS constellation.<sup>65</sup>

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<sup>58</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>59</sup> *See generally NGSO FSS Order*.

<sup>60</sup> Recently, we considered ViaSat's concerns regarding the sufficiency of existing international EPFD limits and found that the ViaSat has not proposed any new EPFD limits and it would not be advisable to remain without Ka-band EPFD limits in our rules pending such deliberations. *NGSO FSS Order* at 20, para. 35.

<sup>61</sup> We note that this condition also addresses several comments that requested that any grant of market access to Telesat be conditioned on compliance with certain pending and future rulemakings. *See* ViaSat Petition to Deny at 9-10; Spire Comments at 5; SpaceX Comments at 5; Hughes Comments at 3.

<sup>62</sup> *See, e.g., NGSO FSS Order; Use of Spectrum Bands Above 24 GHz For Mobile Radio Services*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 8014 (2016) (*Spectrum Frontiers R&O and FNPRM*); *Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, Notice of Inquiry, 32 FCC Rcd. 6373, 6377 n.14 (2017) (*Mid-Band NOI*).

<sup>63</sup> To the extent that commenters believe that their concerns are not already addressed by ongoing rulemakings, we remind commenters that they have the option to file petitions for rulemaking with the Commission.

<sup>64</sup> Telesat may petition for reconsideration of this grant to seek deferral of any of its conditions until after the Commission has made a determination on any relevant issues remaining in the ongoing NGSO FSS rulemaking. *See* 47 CFR § 1.106(c)(2).

<sup>65</sup> SES and O3b Comments at 8-10. Specifically, SES and O3b requested that the Commission include, from the O3b Grant, Conditions 2-10 and Condition 12 for all Ku-/Ka-band NGSO grants and Conditions 1, 11, and 15 for

(continued....)

As in the *OneWeb Order*, 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>66</sup> Telesat has not requested such a condition, and, in any event, it is unclear from the record whether such a condition is appropriate for Telesat's constellation configuration. Accordingly, we do not include such a condition below.<sup>67</sup>

18. *Waiver Standard.* Telesat seeks waivers of several of the Commission's rules.<sup>68</sup> Generally, the Commission may waive any rule for good cause shown.<sup>69</sup> Waiver is appropriate where the particular facts make strict compliance inconsistent with the public interest.<sup>70</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>71</sup> Waiver is therefore appropriate if special circumstances warrant a deviation from the general rule and such deviation will serve the public interest.<sup>72</sup> We address the specific requests for waivers below.

19. *Waivers for 17.8-18.6 GHz.* Telesat seeks waivers of the U.S. Table of Frequency Allocations for operations in the 17.8-18.6 GHz band.<sup>73</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>74</sup> In the 17.8-18.3 GHz band, Telesat 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, Telesat provided technical demonstrations showing that it will comply with international EPFD limits designed to protect GSO networks. In addition, Telesat states that its system will not cause harmful interference to and is willing to accept interference from primary operators in these frequency bands.<sup>75</sup>

20. Telesat provided technical demonstrations of how it will protect both primary terrestrial operations and GSO FSS operations.<sup>76</sup> Telesat's proposed operations in this band are also consistent with

(Continued from previous page) \_\_\_\_\_

U.S. market access Ku-/Ka-band NGSO grants. *Id.* See also *O3b Limited*, IBFS File Nos. SAT-LOI-20141029-00118 and SAT-AMD-20150115-00004 (grant stamp dated Jan. 22, 2015).

<sup>66</sup> *Id.* at Condition 11.

<sup>67</sup> To the extent that O3b is concerned about the status of its current and future operations relative to other NGSO systems, we note that, as a participant in the processing rounds, such concerns will be addressed when the Commission acts on O3b's pending petition. See *O3b Limited*, IBFS File Nos. SAT-AMD-20161115-00116 and SAT-MOD-20160624-00060.

<sup>68</sup> Telesat requests waivers of sections 2.106 and 25.157(e) of the Commission's rules and waiver of the Commission's Ka-band Plan. Telesat Petition, Narrative at 31-33. Telesat states in its petition that its system is "capable of operating with both fixed terminals and mobile terminals." *Id.* at 22. To the extent that Telesat seeks to provide service to mobile terminals in the United States, we note that such earth station operations would require a waiver of section 2.106 of the Commission's rules, 47 CFR § 2.106. As no such waiver was requested by Telesat in its petition, operations with mobile terminals are beyond the scope of this grant of U.S. market access.

<sup>69</sup> 47 CFR § 1.3.

<sup>70</sup> *Northeast Cellular Tel. Co. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990).

<sup>71</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>72</sup> *Northeast Cellular*, 897 F.2d at 1166.

<sup>73</sup> 47 CFR § 2.106. Non-Federal operations in this band are subject to coordination with Federal systems. 47 CFR § 2.106, n.US334.

<sup>74</sup> 47 CFR § 2.106, n.NG164.

<sup>75</sup> Telesat Petition, Technical Exhibit at 6.

<sup>76</sup> To the extent that commenters are concerned about Telesat's EPFD showings, see *supra* paras. 9-10.

our decision to allow NGSO FSS operation in these bands on a secondary basis.<sup>77</sup> These operations should not pose undue burdens on terrestrial services because Telesat's earth stations can be sited and operated in a manner to avoid receiving harmful interference.<sup>78</sup> In light of Telesat's technical demonstrations, and its willingness to operate on an unprotected, non-interference basis, we find good cause to grant a waiver of the Table of Frequency Allocations for operations in this band. This finding is also consistent with the waiver granted to OneWeb recently under similar circumstances.<sup>79</sup> Although the *OneWeb Order* limited the waiver to individually-licensed gateway earth stations, we recently found that such a limitation was unnecessary for NGSO FSS operations in the 17.8-18.6 GHz band that are subject to PFD limits and that blanket licensing of such NGSO FSS operations is feasible.<sup>80</sup> Accordingly, we do not condition Telesat's grant of U.S. market access on any future earth stations being individually-licensed gateways. Until such time as changes to the Table of Frequency Allocations become effective, we grant this waiver for Telesat's operations on a non-conforming basis in these bands on condition that the Telesat system will not claim protection from harmful interference in these bands, and remind Telesat that it undertakes these operations at its own risk.

21. *Waivers for 19.7-20.2 GHz.* Telesat seeks a waiver of the Commission's Ka-band Plan for market access in the 19.7-20.2 GHz frequency band.<sup>81</sup> The 19.7-20.2 GHz frequency band is allocated to the fixed-satellite service and mobile-satellite service (space-to-Earth) on a primary basis,<sup>82</sup> however, the Commission's Ka-band Plan designates this band for the use of the GSO FSS, rather than NGSO FSS systems.<sup>83</sup> In its petition, Telesat provided technical demonstrations to show that it will comply with international EPFD limits designed to protect GSO networks in the 19.7-20.2 GHz frequency band set forth in Article 22 of the ITU Radio Regulations. In addition, Telesat states that it will not cause harmful interference to and is willing to accept interference from GSO FSS operators in this frequency band.<sup>84</sup>

22. In light of Telesat's technical demonstrations, and its willingness to operate on an unprotected, non-interference basis, we find good cause to grant a waiver of the Commission's Ka-band-plan in this frequency band. This finding is similar to waivers previously granted for NGSO operations in the 19.7-20.2 GHz frequency band<sup>85</sup> and is also consistent with the proposal that the Commission recently adopted to allow NGSO FSS operations in this band on a secondary basis, subject to certain

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<sup>77</sup> *NGSO FSS Order* at 4, para. 7.

<sup>78</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) (*2000 18 GHz Band Order*); 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>79</sup> *OneWeb Order*, 32 FCC Rcd at 5373-74, paras. 15-16.

<sup>80</sup> *NGSO FSS Order* at 4, para. 8.

<sup>81</sup> See *2000 18 GHz Band Order*, 15 FCC Rcd 13443-44, para. 28 (removing secondary NGSO FSS allocation in the 19.7-20.2 GHz frequency band).

<sup>82</sup> 47 CFR § 2.106.

<sup>83</sup> *2000 18 GHz Band Order*, 15 FCC Rcd 13443-44, para. 28.

<sup>84</sup> Telesat Petition, Technical Exhibit at 6.

<sup>85</sup> See, e.g., *Northrop Grumman Order*, 24 FCC Rcd. at 2353-55 (permitting NGSO operations in the 19.7-20.2 GHz frequency band due to, *inter alia*, demonstrated compliance with ITU EPFD limits and the non-interference basis of such operations).

power limits.<sup>86</sup> Telesat provided technical demonstrations of how it will protect primary GSO FSS operations. Grant of this waiver will not undermine the purpose of the Ka-band Plan, which is to ensure that primary users of the 19.7-20.2 GHz band are not constrained. We therefore conclude that a waiver is justified until such time as the change to the Commission's Ka-band Plan becomes effective. Consistent with Telesat's statements, we grant this waiver for Telesat's non-conforming operations in this band on condition that the Telesat system will not claim protection from harmful interference in these bands, and remind Telesat that it undertakes these operations at its own risk.

23. *Waiver of Band-Splitting Procedure.* Telesat seeks to operate in the United States throughout the 17.8-18.6 GHz, 18.8-19.3 GHz, 19.7-20.2 GHz, 27.5-29.1 GHz, and 29.5-30 GHz frequency bands. In the 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>87</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>88</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. Telesat requests a waiver of section 25.157(e) in the 17.8-18.6 GHz, 19.7-20.2 GHz, 27.5-28.6 GHz, and 29.5-30 GHz bands arguing that band segmentation would be inconsistent with the approach adopted by the Commission based on avoidance of in-line interference events.

24. Based on our technical review of the Telesat Petition and of other applications and petitions that were submitted in the processing rounds, we conclude that sharing will be possible between the Telesat system, the OneWeb system, and other proposed NGSO FSS systems in all of the bands requested by Telesat. The Telesat space stations will utilize shapeable and steerable user beams while the earth stations communicating with the satellites in the constellation will use steerable directional antennas.<sup>89</sup> Such characteristics, which permit avoidance of interference to other NGSO FSS systems in the 18.8-19.3 GHz, and 28.6-29.1 GHz bands, also permit avoidance of interference in the 17.8-18.6 GHz, 19.7-20.2 GHz, 27.5-28.6 GHz, and 29.5-30 GHz bands. Thus, because Telesat's particular system design enables sharing by avoiding interference events in all 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), since we recently adopted changes to the Commission's rules that will apply a spectrum sharing mechanism to all NGSO FSS systems that have sharing capabilities (e.g., directional earth station antennas), regardless of the frequency bands used.<sup>90</sup> Because these changes are not yet effective, we grant a waiver of section 25.157(e), consistent with the Commission's grant of a similar waiver in the *OneWeb Order*.<sup>91</sup>

#### IV. CONCLUSION

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

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<sup>86</sup> *NGSO FSS Order* at 5, paras. 9-10.

<sup>87</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>88</sup> 47 CFR § 25.157(e).

<sup>89</sup> Telesat Petition, Technical Exhibit at 3, 5.

<sup>90</sup> *NGSO FSS Order* at 18, para. 52 (applying the newly adopted section 25.161 to NGSO FSS systems in any frequency band).

<sup>91</sup> See *OneWeb Order*, 32 FCC Rcd at 5379, para. 29.

## V. ORDERING CLAUSES

26. Accordingly, IT IS ORDERED, that the Petition for Declaratory Ruling filed by Telesat Canada, 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 27-32 below.<sup>92</sup>

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

- a. Communications between U.S.-licensed earth stations and Telesat space stations must comport with all existing and future space station coordination agreements reached between Canada and other administrations. In the absence of a coordination agreement, such communications must comport with applicable provisions of the ITU Radio Regulations.
- b. 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. This waiver terminates upon the effective date of changes made to the U.S. Table of Frequency Allocations adopted in FCC 17-122, which permit communications in the 17.8-18.6 GHz frequency band with non-Federal NGSO FSS systems on a secondary basis. 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.
- c. 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).
- d. Waiver of the Commission's Ka-band Plan, IS GRANTED. Communications in the 19.7-20.2 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. This waiver terminates upon the effective date of changes made to the Commission's Ka-band Plan adopted in FCC 17-122, which permit communications in the 19.7-20.2 GHz frequency band with NGSO FSS systems on an unprotected basis and on a secondary basis to GSO FSS operations. In addition, such communications must comport with the applicable EPFD limits and requirements in Article 22 of the ITU Radio Regulations.
- e. 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.
- f. 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, and will comply with any determinations set forth in the Spectrum Frontiers proceeding (GN Docket 14-177).<sup>93</sup>

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<sup>92</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 that it is unnecessary to include the boilerplate language requested by SES and O3b. *See* SES and O3b Comments at 8-9.

<sup>93</sup> Telesat states that its use of the frequency band 27.5-28.35 GHz (Earth-to-space) in the U.S. will be for gateway uplink communication and that it will comply with the FCC mechanisms for sharing with the UMFUS addressed in the *Spectrum Frontiers R&O and FNPRM*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd. 8014 (2016). *See* Technical Exhibit at 7.

- g. 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.
- h. Operations must comply with spectrum sharing procedures among NGSO FSS space stations specified in 47 CFR § 25.261 with respect to any NGSO system licensed or granted U.S. market access pursuant to the processing rounds initiated in Public Notice, DA 16-804 and Public Notice, DA 17-524.

28. Any future grant of earth station licenses for operations with the Telesat system will be subject to the following conditions, unless such conditions are satisfied prior to such license grant:

- a. Space-to-Earth operations in the 17.8-18.6 GHz, 18.8-19.3 GHz, and 19.7-20.2 GHz frequency 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, 18.8-19.3 GHz, and 19.7-20.2 GHz bands must be in accordance with any signed coordination agreement reached between Telesat and U.S. Federal operators. Two weeks prior to the start of any operations in the 17.8-18.6 GHz, 18.8-19.3 GHz, or 19.7-20.2 GHz bands, Telesat must provide contact information for a 24/7 point of contact for the resolution of any harmful interference to Jimmy Nguyen, Email: [Jimmy.Nguyen@us.af.mil](mailto:Jimmy.Nguyen@us.af.mil).
- b. Prior to initiation of service, Telesat must receive a favorable or “qualified favorable” finding in accordance with Resolution 85 with respect to its compliance with applicable EPFD limits in Article 22 of the ITU Radio Regulations. Telesat must communicate the ITU finding to the Commission and submit the files containing the data used as input to the ITU validation software, unless they have been submitted before and do not need any update.
- c. At least ninety days prior to the initiation of service to the public, Telesat must submit in File No. SAT-PDR-20161115-00108 a comprehensive technical showing for its NGSO FSS system in the 17.8-18.6 GHz and 19.7-20.2 GHz frequency bands, 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.

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

- a. Telesat 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 Resolution 76 of the ITU Radio Regulations.
- b. Telesat shall be subject to the rules regarding the sharing of ephemeris data in section 25.271 of the Commission’s rules, 47 CFR § 25.271(e), until the effective date of the changes adopted in FCC 17-122.<sup>94</sup> After that, Telesat must comply with the sharing of ephemeris data procedures described in new section 25.146 of the Commission’s rules, 47 CFR § 25.146(e).
- c. Telesat 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.
- d. Upon finalization of its space station design and prior to initiation of service, Telesat must seek and obtain the Commission’s approval of a modification specifying additional details regarding risk of collision and its end-of-life operations, as discussed in paragraph 14 above.

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<sup>94</sup>In the *NGSO FSS Order*, we extended the requirement for NGSO FSS operators to share ephemeris data to all frequency bands in which NGSO FSS systems operate. See *NGSO FSS Order* at 18 and 20, paras. 52, 58 n.131.

30. 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.

31. This declaratory ruling does not address the provision of any Direct-to-Home (DTH) service, Direct Broadcast Satellite Service (DBS)<sup>95</sup> or Digital Audio Radio Service (DARS) to, from, or within the United States.

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

Telesat must post a surety bond in satisfaction of 47 CFR §§ 25.165(a)(1) & (b) no later than **December 3, 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

Telesat must launch the space stations, place them in the assigned orbits, and operate them in accordance with the station authorization no later than **November 3, 2023**, 47 CFR § 25.164(b).<sup>96</sup>

This grant of U.S. market access will be null and void automatically, without further Commission action if Telesat 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 Telesat's surety bond. By **November 18, 2023**, Telesat 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).

33. IT IS FURTHER ORDERED that based on the spectrum sharing opportunities provided by paragraph 27(h) 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.

34. IT IS FURTHER ORDERED that the Petition to Deny of ViaSat, Inc. IS GRANTED to the extent that some of the conditions requested by ViaSat are imposed, as indicated herein, and is otherwise DENIED.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch  
Secretary

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<sup>95</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).

<sup>96</sup> The NGSO FSS Order, modified section 25.164(b) to offer additional flexibility and requires launch and operation of 50 percent of an authorized system within six years of grant and the remaining satellites within nine years of grant. *NGSO FSS Order* at 22-23, paras. 66-67.