WAIVER REQUESTS

Pursuant to Section 1.3 of the Commission's rules, the Commission may waive its rules for good cause shown.[1] "Waiver is appropriate if special circumstances warrant a deviation from the general rule and such deviation would better serve the public interest than would strict adherence to the general rule," including "more effective implementation of overall policy."[2] In determining whether waiver is appropriate, the Commission should "take into account considerations of hardship, equity, or more effective implementation of overall policy."[3] As shown below, there is good cause for the Commission to grant a waiver of Sections 25.156/25.157, and, to the extent necessary, limitations in the Commission's Schedule S.

1. WAIVER OF PROCESSING ROUND REQUIREMENTS

Myriota requests waiver of Sections 25.156 and 25.157 of the Commission's rules, which provide for the processing of applications for "NGSO-like satellite systems" under a modified processing round framework. Myriota requests instead that this Application be processed pursuant to the first-come, first-served ("FCFS") procedure adopted for "GSO-like satellite systems" under Section 25.158 of the Commission's rules.

In the ordinary course, the Commission's rules contemplate that an application for an "NGSO-like satellite system" authorization will trigger the initiation of a modified processing round for competing NGSO system applications pursuant to Section 25.157 of the Commission's

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1 47 C.F.R. § 1.3. *See also WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969), *cert. denied*, 409 U.S. 1027 (1972); *Northeast Cellular Telephone Co., LP v. FCC*, 897 F.2d 1164 (D.C. Cir. 1990).

2 *GE American Communications, Inc.*, 16 FCC Rcd. 11038, ¶ 9 (Int'l Bur. 2001).

3 *WAIT Radio*, 418 F.2d at 1159.

rules.[4] The Commission's NGSO processing round regime was intended to "ensure orderliness, expedition and finality in the licensing process" while also achieving "fairness among applicants and permit[ting] the rapid dispatch of Commission business."[5] In adopting these rules, the Commission stated its twin goals of establishing "satellite licensees' operating rights clearly and quickly" and ensuring "that there is the most efficient use of the satellite spectrum and orbit resources."[6]

Notwithstanding this rule, the Commission has waived the modified processing round requirement and allowed certain NGSO satellite system applications to be processed on a FCFS basis on multiple occasions. For example, in *Space Imaging, LLC*, the Commission explained that "[t]he purpose of the modified processing round rule is to preserve opportunities for competitive market entry in frequency bands where licensing the first applicant to operate throughout the band would prevent subsequent applicants from using the spectrum."[7] Because the Commission concluded that NGSO operators in the earth exploration satellite service ("EESS") are generally capable of sharing spectrum such that authorizing Space Imaging to operate in its requested EESS frequency bands would not preclude other NGSO operators from operating in those bands, the Commission found waiving the rule to be appropriate.[8] Subsequent waivers have been granted to

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4 For example, Section 25.157(c) provides that an NGSO system application not filed in response to such a public notice will initiate a new processing round. *See* 47 C.F.R. § 25.157(c).

5 *EchoStar Satellite Corp.*, 16 FCC Rcd. 14300, ¶ 5 (IB 2001), *recon. denied*, 17 FCC Rcd. 8305 (IB 2002).

6 *Amendment of the Commission's Space Station Licensing Rules and Policies*, 18 FCC Rcd. 10760, ¶ 7 (2003).

7 *Space Imaging, LLC*, 20 FCC Rcd 11964, ¶ 10 (IB 2005).

8 *See id.* ¶¶ 10-11.

other EESS operators, each premised on a showing that such operators would be capable of sharing with current and future NGSO systems operating in the same frequency bands.[9]

In the NVNG MSS context, the Commission has previously determined that it should issue licenses on an FCFS basis. The Commission has previously held two processing rounds for NVNG MSS applications. The Commission did not authorize any NVNG system to operate in the 399.9-400.05 MHz band at that time (or in subsequent years). However, three of the five issued NVNG licenses (for Systems 1, 2, and 5 (VITA)) included authority to operate in the 400.15-401 MHz band.[10] By December 2005, all three of these licenses had been either cancelled for failure to meet applicable deployment milestones or surrendered.

When the Commission reclaimed these three licenses, it announced that the licensed spectrum would be made available on an FCFS basis.[11] Consistent with that policy, the Commission has reissued some of the available NVNG spectrum to the only applicant to date (Orbcomm) without a processing round.[12] Accordingly, Myriota's application should be processed in the same way.

Yet even in the absence of this stated Commission policy, Myriota's system has the flexibility and spectral efficiency to be able to operate harmoniously with Orbcomm and other NVNG systems. For example, Myriota's satellites can vary the bandwidth of their emissions

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9 *See e.g., Digital Globe, Inc.*, 20 FCC Rcd. 15696, ¶ 8 (IB 2005); *BlackSky Global LLC*, IBFS File No. SAT-LOA-20180320-00023, ¶ 9 (granted Oct. 3, 2018); *Planet Labs, Inc.,* IBFS File No. SAT-LOA- 20130626-00087, ¶ 4 (granted Dec. 3, 2013); *Skybox Imaging, Inc.,* IBFS File No. SAT-LOA-20120322-00058, ¶ 4 (granted Sept. 20, 2012).

10 *See Amendment of Part 25 of the Commission's Rules to Establish Rules and Policies Pertaining to the Second Processing Round of the Non-Voice, Non-Geostationary Mobile-Satellite Service*, 13 FCC Rcd. 9111, ¶ 10 (1997) ("*Second NVNG Processing Round Order*").

11 *See* Public Notice, 19 FCC Rcd. 4804 (2004) (Final Analysis cancellation); Public Notice, 19 FCC Rcd. 5368 (2004) (Leo One cancellation); Public Notice, 20 FCC Rcd. 20273 (2005) (VITA surrender).

12 *See Orbital Communications Corp.*, 23 FCC Rcd. 4804, ¶ 10 (IB 2008).

through on-board processing, and dynamically control their emissions to accommodate sharing arrangements with other users of the band. Myriota downlink emissions can range in bandwidth between 10-140 kHz and operate within the entire 850 kHz MSS allocation or any portion thereof designated for their use. Myriota downlink emissions can employ frequency hopping to move throughout the assigned band – a capability that the Commission has recognized "uses the limited amount of spectrum most efficiently."[13] By combining the 10% duty cycle with the flexibility of the software defined radio on board its satellites, Myriota will be able to share spectrum by coordinating usage and/or time of operations.

Similarly, in the uplink band, both IoT modules and micro-gateways transmit only when a Myriota satellite is overhead, significantly reducing the times during which interference is even theoretically possible. All of Myriota's NVNG terrestrial stations operate with less than 5 dBW EIRP, which would be within the limit currently proposed by the United States under Agenda Item 1.2 to be considered at the World Radio Conference later this year.[14] Myriota's IoT modules will operate with typical transmit duty cycle less than 0.02%, and occasionally with duty cycle of 0.5%. They employ frequency hopping across the intended band, with a narrow emission bandwidth of just 2 kHz. Myriota's micro-gateways will typically operate with transmit duty cycle less than 0.5% and occasionally up to 5%, with emission bandwidth ranging from 2-20 kHz. Since the micro-gateways are far less numerous than other devices communicating with Myriota satellites in this band and they remain within the EIRP limit under consideration internationally, their slightly higher duty cycle will have a negligible effect on the spectrum environment. These

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13 *Second NVNG Processing Round Order* ¶ 71.

14 *See* FEDERAL COMMUNICATIONS COMMISSION, DOCUMENT WAC/086, DRAFT PROPOSALS PRESENTED AT MARCH 11TH, 2019 MEETING OF THE WORLD RADIOCOMMUNICATION CONFERENCE ADVISORY COMMITTEE, AGENDA ITEM 1.2 (2019).

operating characteristics give Myriota the ability to share the entire 150 kHz range with other NVNG systems also operating in the 399.9-400.05 MHz band, as well as the ability to operate in any portion of the band designated for its use.

These are precisely the types of technological capabilities that the Commission has recognized as facilitating spectrum sharing among NVNG systems.

> Frequency sharing techniques, such as dynamic channel activity assignment ("DCAAS"), time-sharing and frequency hopping, allow multiple satellite systems to share the same frequency bands. DCAAS allows an FDMA or TDMA system to scan the channels in a frequency band and assign transmissions to channels that are not currently in use by other users of the band. Time-sharing allows multiple satellite systems to use the same frequency band at different times and thereby avoid interfering with other satellite systems or authorized users operating in the band. Frequency hopping enables a Little LEO satellite to switch or "hop" to an alternative sub-band within a frequency band when the sub-band it is using becomes unavailable. [15]

The Commission concluded that an NVNG system "employing a combination of these sharing techniques can avoid interference to other systems."[16] Given that "[a] primary Commission objective is to create a regulatory environment that fosters the provision of efficient, innovative, and cost-effective NVNG MSS communications services in the United States,"[17] Myriota's ability to implement such sharing techniques to make highly efficient use of spectrum for its innovative services will promote that important objective.

Myriota recognizes that Hiber Inc. has also filed an application seeking U.S. market access using the same NVNG spectrum targeted by Myriota.[18] In support of a waiver of the Commission's processing round rules, Hiber contends that its system "is fully capable of sharing

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15 *Second NVNG Processing Round Order* ¶ 50.

16 *Id.*

17 *Id.* ¶ 11.

18 *See* Petition for Declaratory Ruling, IBFS File No. SAT-PDR-20180910-00069 (Sep. 10, 2018) ("Hiber PDR").

with current and future NGSO systems operating in the same frequency bands, and thus there is no mutual exclusivity" and its system would not preclude entry by other NVNG systems in the future.[19] It would appear that the Commission agreed, since it recently accepted the Hiber PDR for filing without opening a new processing round.[20] Since both Myriota and Hiber will only transmit for a small fraction of time, there is a very low probability of harmful interference between the systems even while sharing the same spectrum. Myriota is also aware that the Commission has received an application from Spire Global, Inc. ("Spire"), which proposes to operate back-up TT&C uplinks in a very small piece of the 399.9-400.05 MHz band for its EESS system.[21] Spire contends that because its use of this spectrum for back-up TT&C operations will be very infrequent and it is willing to turn off its earth station transmitter when the NVNG satellite of another operator is in view, its operations would not preclude use of this spectrum by other NVNG systems.[22]

Accordingly, the use of this NVNG spectrum by any one of the current applicants would not preclude its use by the others. As described above, the spectrally efficient and flexible software defined radio on board its satellites will enable Myriota to share with Hiber and Spire under a variety of possible arrangements. Thus, as in the EESS context, waiver of the processing round requirement would serve the public interest.[23]

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[19] Hiber PDR at 8.

[20] *See* Public Notice, Rep. No. SAT-01379 (Mar. 22, 2019).

[21] The Commission deferred consideration of Spire's application with respect to this band. *See, e.g.,* Stamp Grant, IBFS File Nos. SAT-LOA-20151123-00078 and SAT-AMD-20180102-00001, at n.2 (Nov. 29, 2018).

[22] *See* Letter from Letter from Jonathan Rosenblatt to Jose P. Albuquerque, IBFS File Nos. SAT-LOA-20151123-00078, SAT-AMD-20161114-00107, and SAT-AMD-20180102-00001, at 5-6 (May 16, 2018) ("Spire Letter").

[23] However, if the Commission cannot make the determination that the grant of one NVNG MSS system application would not prevent subsequent applicants from using the same spectrum – and impose a regime to ensure that NVNG operators negotiate in good faith to achieve an appropriate sharing arrangement – it should implement its processing round rules so that all interested parties can pursue this spectrum on equal footing.

2. WAIVER OF SCHEDULE S LIMITATIONS

As required by the Commission's rules,[24] Myriota has submitted with this application a completed Schedule S, which contains certain technical information in a prescribed form. Unfortunately, Myriota has found that it cannot accurately describe its system in two respects due to limitations in Schedule S itself. To the extent necessary, Myriota requests that the Commission waive these aspects of Schedule S in light of the form's limitations.

Section 25.114(c)(4)(v) requires both the minimum and maximum saturation flux density ("SFD") values for each space station receive antenna that is connected to transponders. The concept of SFD only applies to "bent pipe" satellite systems, and thus is not relevant to the Myriota system. However, the Schedule S software does not allow an entry of "not applicable." Instead, it requires a numerical entry for SFD, which must be different for the maximum and minimum values. In order to accommodate this requirement, Myriota has entered values of "0" and "-0.1" in Schedule S with respect to these parameters.

Schedule S also requires submission of numerical values for antenna pointing and rotational error – a concept that may be of limited applicability with respect to a dipole antenna such as Myriota's spacecraft will employ. Myriota anticipates that its antenna will have up to five degree pointing and rotational error. However, the Schedule S software does not allow an entry of any value greater than two. Accordingly, Myriota has entered this maximum value on the form, even though it does not accurately capture the value that should be entered.

[24] *See* 47 C.F.R. § 25.114(a)(1).