

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

In the Matter of	)	
	)	
<b>SWARM TECHNOLOGIES INC.</b>	)	
	)	
Amendment to Application to Modify the	)	File No. SAT-AMD-20200504-00041
Authorization for the Swarm	)	File No. SAT-MOD-20200501-00040
NGSO Satellite System	)	

**PETITION TO DISMISS OR DENY**

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## SUMMARY

A mere seven months after receiving an authorization from the Commission in which Swarm claimed that it would not operate in spectrum that had been assigned to ORBCOMM on a primary basis, Swarm has now filed an Amendment Application proposing to expand its operations to those portions of the 137-138 MHz and 148-150.05 MHz bands where ORBCOMM has primary, first-in-time license rights. In addition, in its initial application Swarm indicated that it could offer a wide variety of services using the amount of spectrum it then sought. Swarm also had claimed that it could implement its proposed system in full conformity with the NVNG MSS service rules, including the duty cycle and duration limits of Footnote US323 – a claim that ORBCOMM had challenged, because many of the services proposed by Swarm clearly appear to be incompatible with the NVNG MSS operating Rules. Now, without identifying any material change in Swarm’s proposed service offerings, the Amendment Application seeks to double the size of the Swarm satellite constellation, at least double the required spectrum, and seeks a waiver of the NVNG MSS operating constraints that Swarm claims has somehow become necessary. The Commission should not countenance such a “bait and switch” regulatory strategy.

The Amendment Application is patently defective because Swarm failed to include a showing of the specific means by which its proposed modified system would be able to avoid unacceptable interference to ORBCOMM, as specified in Section 25.142(a)(1) of the Commission’s rules:

Applicants must also file information demonstrating compliance with all requirements of this section, and showing, based on existing system information publicly available at the Commission at the time of filing, ***that they will not cause unacceptable interference to any non-voice, non-geostationary mobile-satellite service system authorized to construct or operate.*** (emphasis added)

Instead, Swarm merely asserts, without any coherent substantiation, that it will offer “services without unduly affecting incumbent operations.” And rather than meet its obligation to conclusively demonstrate how it will avoid unacceptable interference to ORBCOMM, Swarm simply makes vague claims regarding theoretical sharing techniques that it asserts could make this possible. For example, Swarm “believes that a combination of sharing strategies will enable it to share spectrum effectively with ORBCOMM, especially given the comparatively low power (and low power density) of Swarm’s transmissions in any given direction.” However, ORBCOMM has no way to assess Swarm’s claims, because Swarm has provided virtually no information on the technical characteristics of its user terminals in the Amendment Application or elsewhere. Nor does Swarm specify how it would protect ORBCOMM using the “combination of sharing strategies,” other than vaguely claiming that “Swarm can also share channels by using time-division multiple access (TDMA) and by implementing geographic sharing techniques.”

Likewise, Swarm's invocation of its "Carrier-Sense Multiple Access media access control protocol with Collision Avoidance (CSMA/CA), which employs a 'listen-before-talk' protocol to verify the absence of other traffic before transmitting on a given channel" technology will clearly not avoid unacceptable interference to ORBCOMM. While such a technique may or may not protect nearby Federal terrestrial radios, it does not provide any sufficient level of protection to ORBCOMM's operations. This is because the ORBCOMM satellite footprints are much larger than any area in which a Swarm user terminal will be "listening", which would likely result in Swarm transmissions jamming ORBCOMM uplink transmissions.

There are also several features of the Swarm system that will exacerbate the risks of unacceptable interference. Swarm proposes to operate much wider uplink channels than ORBCOMM – Swarm's uplink channels are nominally 50 kHz, but it seeks authority for channel bandwidths up to 259 kHz, in contrast to ORBCOMM's 5 kHz uplink channels. In addition, Swarm does not propose dedicated feeder links, which means that high-intensity feeder link usage could occur throughout the bands. Moreover, Swarm's proposal in the Amendment Application to double the size of its constellation, and the attendant two-fold or greater increase of possible simultaneous spectrum occupancy, would even further increase the potential for incidents of blocking and interference to ORBCOMM's primary status operations.

Finally, Swarm's proposed waiver of the Footnote US323 operating limits could also further exacerbate the interference problems by increasing the duration and number of Swarm user terminal transmissions. ORBCOMM thus objects to grant of the waiver, as well. To the extent that the Federal government usage of the band has evolved since the rules were adopted, any changes to the Footnote US323 conditions should occur in a rulemaking, because all of the NVNG MSS systems will be affected. Moreover, Swarm fails to meet the standards for a waiver. . Swarm has not identified anything unique to Swarm's system that makes it inequitable or unduly burdensome to apply the constraints of US323, Furthermore the, increased interference to ORBCOMM that would occur is contrary to the applicable Commission Rules, policies, and decisions, and clearly would not serve the public interest.

For all of these reasons, the Commission should deny or dismiss the Amendment Application.

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NGSO Satellite System	)	

**PETITION TO DISMISS OR DENY**

ORBCOMM License Corp. (“ORBCOMM”) hereby requests that the Commission dismiss or deny the above-captioned applications (collectively, the “Amendment Application”) filed by Swarm Technologies Inc. (“Swarm”).<sup>1</sup> The Amendment Application fails to comply with the Commission’s Rules because it does not demonstrate that that the proposed amended operations of Swarm’s non-geostationary orbit satellite system (the “Swarm System”) will conform to the requirements for the Non-Voice, Non-Geostationary Mobile Satellite Service (“NVNG MSS”). Among other things, the Amendment Application misrepresents the applicable Commission Rules, policies, and decisions in an attempt to obfuscate and disregard ORBCOMM’s clearly vested NVNG MSS first-in-time spectrum rights. As explained herein, the Amendment Application is patently defective, contravenes the Commission’s Rules, and should be dismissed or denied.

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<sup>1</sup> *Public Notice*, Report No. SAT- 01482, July 17, 2020

Swarm in its initial 2018 NVNG MSS space segment license application asserted that it did not need to demonstrate how it would avoid causing unacceptable interference to ORBCOMM, because it would not operate in any of the frequencies assigned to ORBCOMM on a primary basis.<sup>2</sup> And just seven months after receiving its authorization,<sup>3</sup> Swarm has reversed course, and now proposes to operate in spectrum licensed on a primary basis to ORBCOMM, utilizing a modified constellation that would be double the size of the currently authorized Swarm system (with a presumed commensurate doubling of simultaneous spectrum occupancy requirements).

As explained more fully below, Swarm neither acknowledges ORBCOMM's priority interference protection rights, nor makes any effort to adequately demonstrate how it will avoid causing unacceptable interference to ORBCOMM's operations. The little information that is included in the Amendment Application regarding Swarm's significant proposed increased spectrum utilization provides no comfort whatsoever that Swarm's proposed operations in ORBCOMM's primary licensed spectrum will not cause unacceptable interference to ORBCOMM. Because of its failure to conform to this fundamental requirement of the NVNG MSS Rules requiring new applicants to demonstrate an absence of unacceptable interference to incumbent licensees, the Commission should dismiss or deny the Amendment Application.

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<sup>2</sup> Swarm Initial Application, File No. SAT-LOA-20181221-00094, Narrative Exhibit at p. 26.

<sup>3</sup> *Swarm Technologies, Inc.*, 34 FCC Rcd 9469, released October 17, 2019 (hereafter cited as "*Swarm Authorization*").

The Amendment Application seeks authority to amend Swarm’s above-captioned May 1, 2020, application to modify the Swarm Authorization.<sup>4</sup> The FCC issued the Swarm Authorization just seven months before Swarm filed the Amendment Application. In claiming the public interest benefits of that original application, Swarm touted a list of services it would be able to provide if that application was granted.<sup>5</sup> And in opposing Swarm’s original application, ORBCOMM pointed out a significant flaw in their attempted justification:

Indeed, in claiming the public interest benefits of the Swarm System, Swarm cites to its anticipated offerings, several of which appear to be patently incompatible with the Commission’s applicable NVNG MSS operating constraints. These incompatible claimed Swarm offerings include precision agriculture, remote patient monitoring, connected cars, and a substitute for cellular service. Notwithstanding the various other defects in the Application, Swarm’s failure to acknowledge or even attempt to demonstrate how its proposed system will comply with the Commission’s NVNG MSS co-primary interservice operating constraints is more than sufficient grounds for the Commission to deny or dismiss the Application.<sup>6</sup>

Lo and behold, ORBCOMM was right, because without making any material change to its service proposals, Swarm in the Amendment Application is now claiming it cannot meet its business aspirations unless it is permitted to double the number of satellites, and at least double the spectrum occupancy, for its proposed system. Furthermore, although Swarm had assured the Commission that it could implement its system and provide its proposed services in full accordance with the NVNG MSS Rules, again without making any material change to Swarm’s proposed service offerings, the Amendment Application now also seeks a waiver of the long-

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<sup>4</sup> SAT-MOD-20200501-00040, *Public Notice*, Report No. SAT- 01482, July 17, 2020.

<sup>5</sup> Swarm Initial Application, File No. SAT-LOA-20181221-00094, Narrative Exhibit at pp. 29-30.

<sup>6</sup> ORBCOMM Petition to Dismiss, Deny or Hold in Abeyance, File No. SAT-LOA-20181221-00094 at pp. 4-5.

established NVNG MSS operating constraints set forth in US Footnote 323 of the United States Table of Frequency Allocations.<sup>7</sup> The Commission should not countenance such a “bait and switch” regulatory strategy. Moreover, as demonstrated below, Swarm has failed to adequately justify its requested waiver of the NVNG MSS operating constraints. For all of these reasons, the Commission should deny the Amendment Application.

***Swarm’s Failure to Meet Its Obligation to Demonstrate how it will Avoid Unacceptable Interference to ORBCOMM is Fatal to Its Amendment Application***

ORBCOMM was instrumental in the creation of the NVNG MSS, having filed both the original petition for rulemaking to allocate spectrum and create the NVNG MSS service rules, and the first Commission NVNG MSS space segment license application back in 1990. The Commission granted ORBCOMM’s initial space segment license in 1994,<sup>8</sup> and it granted a modification to that authorization in 1997 as part of the second processing round.<sup>9</sup> In addition, in connection with the deployment of ORBCOMM’s second generation satellite system, the Commission further modified ORBCOMM’s satellite license authorizing ORBCOMM’s use of additional frequencies – the “System 1” frequencies from the second processing round.<sup>10</sup> Among

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<sup>7</sup> Amendment Application Narrative Exhibit at pp. 38-39.

<sup>8</sup> *Application of ORBCOMM for Authority to Construct, Launch, and Operate a Non-Voice, Non-Geostationary Mobile-Satellite System*, Order and Authorization, 9 FCC Rcd 6476 (1994); *recon.*, 10 FCC Rcd 7801 (1995).

<sup>9</sup> *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 (1997)(hereafter cited as “*Second Processing Round Order*”). The Commission shortly thereafter issued ORBCOMM’s modified authorization. *Orbital Communications Corp.*, 13 FCC Rcd 10828 (Int’l Bur. 1998).

<sup>10</sup> *ORBCOMM License Corp.*, 23 FCC Rcd 4804 (2008)(hereafter cited as “*ORBCOMM 2008 Modification Order*”).

other things, the addition of the System 1 frequencies combined with ORBCOMM's NVNG MSS authorization by the *ORBCOMM 2008 Modification Order* established ORBCOMM's primary interference-protected right to spectrum access for subscriber uplink and downlink operations in respective portions of the 148 – 150.05 MHz band uplink and 137-138 MHz band downlink NVNG MSS frequency bands.<sup>11</sup>

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<sup>11</sup> *ORBCOMM 2008 Modification Order*, at ¶¶ 10-11 & 23(a). See, also, e.g., *Second Processing Round Order*, at ¶¶ 50, 56, and 63-64. In opposing Swarm's initial application, ORBCOMM had contended that any additional NVNG MSS systems should only be authorized in conformance with the rules adopted in the NVNG MSS Second Processing Round, and that ORBCOMM was entitled to operate throughout the NVNG MSS spectrum prior to any such entry. The Commission disagreed with ORBCOMM and authorized Swarm to operate in spectrum that had originally been reserved for a CDMA system (which Swarm is not), but in any event ORBCOMM continues to have primary rights to operate in portions of the 137-138 MHz and 148-150.05 MHz band, which the Commission acknowledged in its decision authorizing Swarm. *Swarm Authorization* at ¶ 12 (“Swarm has not requested use of any of the bands **assigned to ORBCOMM on a primary basis vis-à-vis other MSS systems**. Consequently, we disagree with ORBCOMM's assertion that Swarm is disregarding ORBCOMM's spectrum rights.” (emphasis added)). Indeed, the Commission in the *Swarm Authorization* at n. 36 referenced the particular bands in which ORBCOMM has primary rights (as set forth in the *ORBCOMM 2008 Modification Order* at ¶ 23(b):

Specifically, the Commission authorized operations in the 148-148.25 MHz, 148.75-148.855 MHz, and 148.905-149.9 MHz uplink frequency bands, and the 137.175-137.3275 MHz, 137.4225-137.4725 MHz, 137.535-137.585 MHz, 137.650-137.750 MHz and 137.7875-137.8125 MHz downlink frequency bands and additional frequency bands described as “System 1” in the *Second Processing Round Order*, generally including the 148-148.25 MHz, 148.75-148.855 MHz, 148.905-149.81, and 150.05 MHz uplink frequency bands, and the 137-137.025 MHz, and 400.15-400.505, and 400.645-401 MHz downlink frequency bands, on a primary basis. Operations on other frequencies in the 137-138 MHz and 148-150.05 MHz bands are “authorized subject to ORBCOMM Licensee Corp. operating using only frequency bands assigned to it on a primary basis, consistent with the spectrum sharing plan adopted by the Commission in that *Report and Order*, upon commencement of operations by another U.S.-licensed non-voice, non-geostationary mobile satellite system.” *Id.* at 4812.

Furthermore, the Commission’s rules explicitly codify a first-in-time priority right for spectrum access by NVNG MSS licensees:

Applicants must also file information demonstrating compliance with all requirements of this section, ***and showing, based on existing system information publicly available at the Commission at the time of filing, that they will not cause unacceptable interference to any non-voice, non-geostationary mobile-satellite service system authorized to construct or operate.***<sup>12</sup>

Despite this clear obligation, the Amendment Application fails to provide any plausible demonstration that the proposed modifications to the Swarm System will not cause unacceptable interference to ORBCOMM’s primary spectrum operations. Rather than attempt to meet the rule requirement, Swarm vaguely claims that they will offer “services without unduly affecting incumbent operations.”<sup>13</sup> ORBCOMM has no idea what this alternative standard proffered by Swarm even means. Moreover, Swarm made no demonstration of how it would avoid “unduly affecting” ORBCOMM, much less the required demonstration that it “will not cause unacceptable interference to ORBCOMM.”

As an initial matter, ORBCOMM notes that the NVNG MSS rules encourage applicants to coordinate with the incumbent licensees.<sup>14</sup> But Swarm made no effort to coordinate with ORBCOMM before or after filing its Amendment Application. And this is despite the fact that in our comments on the initial Swarm application, we discussed the Commission’s

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<sup>12</sup> 47 C.F.R. § 25.142(a)(1) (emphasis added).

<sup>13</sup> Amendment Application Narrative Exhibit at p. 2.

<sup>14</sup> 47 C.F.R. § 25.142(b)(3): “Applicants for authority to establish non-voice, non-geostationary mobile-satellite service systems are encouraged to coordinate their proposed frequency usage with existing permittees and licensees in the non-voice, non-geostationary mobile-satellite service whose facilities could be affected by the new proposal in terms of frequency interference or restricted system capacity.”

recommendation of pre-filing coordination, and indicated that we stand ready to coordinate in good faith.<sup>15</sup> However, any such coordination must take into account our first-in-time priority rights.

Swarm misleadingly asserts that “[f]requencies assigned to ORBCOMM on a primary basis were always intended to be shared with other NVNG MSS systems, and the Commission’s existing rules explicitly require ORBCOMM to coordinate with new systems pursuant to Section 25.142(b)(3).”<sup>16</sup> ORBCOMM has previously reached mutually agreed spectrum sharing agreements in both the initial NVNG MSS processing round and Second Processing Round. In both of these proceedings ORBCOMM and the other involved NVNGS MSS applicants had equal standing as timely filed mutually exclusive processing round application. In stark contrast, however, in the context of the Amendment Application, as a later-filed ‘new-comer’ applicant, Swarm has an obligation to avoid causing unacceptable interference to ORBCOMM’s services, as specified in Section 25.142(a)(1) of the Commission’s rules.

Swarm is not entitled to rely on the sharing agreed to amongst intra-round applicants in the Second Processing round. Among other things, that plan was agreed to by all of the applicants within that processing round, and based on specific sharing techniques and

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<sup>15</sup> ORBCOMM Petition to Dismiss, Deny or Hold in Abeyance, File No. SAT-LOA-20181221-00094 at p. 6.

<sup>16</sup> Amendment Application Narrative Exhibit at p. 30. In fact, the cited rule provides:

All affected applicants, permittees, and licensees shall, at the direction of the Commission, cooperate fully and make every reasonable effort to resolve technical problems and conflicts that may inhibit effective and efficient use of the radio spectrum; however, the permittee or licensee being coordinated with is not obligated to suggest changes or re-engineer an applicant's proposal in cases involving conflicts.

modulation technologies that would be used in particular portions of the NVNG MSS bands. In contrast, Swarm is a later-filed applicant and it also repudiated those Second Processing Round techniques and technologies in obtaining its authorization.<sup>17</sup> As an incumbent NVNG MSS licensee, ORBCOMM of course will, at the direction of the Commission, “cooperate fully and make every reasonable effort to resolve technical problems and conflicts that may inhibit effective and efficient use of the radio spectrum.” But such “cooperation” and “reasonable efforts” does not include ceding our codified rights to operate free of unacceptable interference from new applicants like Swarm.

Despite the fact that they propose to operate in spectrum in which we have priority rights, and that the rules require that they demonstrate that they will not cause unacceptable interference to ORBCOMM, rather than include any such demonstration, all Swarm does is provide vague and unsubstantiated assertions about the capabilities of their proposed system. They broadly assert that “Swarm can share effectively with the only other NVNG MSS system authorized to operate in VHF and will continue to protect Federal operations through coordination.”<sup>18</sup> As explained above, however, Swarm has an obligation to protect ORBCOMM, as well as protecting the Federal operations.

Similarly, Swarm cavalierly claims that it “believes that a combination of sharing strategies will enable it to share spectrum effectively with ORBCOMM, especially given the comparatively low power (and low power density) of Swarm’s transmissions in any given

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<sup>17</sup> The spectrum applied for by Swarm in its initial application had been reserved for a spread spectrum system. But Swarm is not using a spread spectrum system.

<sup>18</sup> Amendment Application Narrative Exhibit at p. 24.

direction.”<sup>19</sup> However, ORBCOMM has no way to assess Swarm’s claims, because it provides virtually no information on the technical characteristics of its user terminals in the Amendment Application, but merely references its initial application.<sup>20</sup> That initial application, however, provided little or no relevant information on the user terminals, and the Swarm blanket earth station application materials filed to date also fail to fill that void.<sup>21</sup> Thus, ORBCOMM has no idea what Swarm means by its claim of “the comparatively low power (and low power density) of Swarm’s transmissions in any given direction.” Nor does Swarm identify the “combination of sharing strategies,” other than vaguely claiming that “Swarm can also share channels by using time-division multiple access (TDMA) and by implementing geographic sharing techniques.”<sup>22</sup> Swarm does assert that “with access to more VHF MSS frequencies, Swarm will have additional flexibility to avoid active channels and thus deconflict operations without compromising network performance.”<sup>23</sup> To the extent they are talking about “deconflicting” with ORBCOMM as a result of expanding their operations into new spectrum, the conflicts only arise because Swarm has reneged on the promise in its initial application not to operate in any spectrum assigned to ORBCOMM on a primary basis. And while expanding into ORBCOMM’s primary spectrum may not adversely affect Swarm’s network performance – because they did not propose to allow ORBCOMM to share access to the spectrum assigned to Swarm in its authorization -- it surely

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<sup>19</sup> Amendment Application Narrative Exhibit at p. 30.

<sup>20</sup> Amendment Application Narrative Exhibit at p. 8.

<sup>21</sup> File No. SES-LIC-20190612-00769.

<sup>22</sup> Amendment Application Narrative Exhibit at p. 30.

<sup>23</sup> Amendment Application Narrative Exhibit at pp. 30-31.

will adversely affect ORBCOMM's network performance, because of the risk of harmful interference and blocking of ORBCOMM's access to open channels, as discussed below. Moreover, any greater ability of Swarm to "deconflict" with Federal terrestrial users or the NOAA satellites would come at the cost of adversely affecting ORBCOMM, in contravention of ORBCOMM's first-in-time priority rights.

Swarm also touts its "Carrier-Sense Multiple Access media access control protocol with Collision Avoidance (CSMA/CA), which employs a 'listen-before-talk' protocol to verify the absence of other traffic before transmitting on a given channel."<sup>24</sup> While such a technique may or may not protect nearby Federal terrestrial radios, it does not provide any level of protection to ORBCOMM's satellites. This is because an NVNG mobile earth station ("MES") can only sense signals in the 148-149.9 MHz band from other very nearby interfering transmitters (all of which are land-based under existing 148-149.9 MHz band allocations) – at most, *only those* that are located within the unblocked line-of-sight radius of the subject MES. However, the intended satellite uplink receiver is susceptible to harmful interference from a transmitter located anywhere in that satellite's receive antenna footprint (which in the case of a proposed Swarm satellite would be a land area of approximately 2,300 km in diameter, and in the case of an ORBCOMM satellite is approximately 5,100 km in diameter). Consequently, Swarm's proposed MES-based "listen-before-talk" uplink channel assignment interference avoidance system would be ineffective, because it would be extremely susceptible to various co-frequency harmful

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<sup>24</sup> Amendment Application Narrative Exhibit at p. 30. ORBCOMM is confused, however, because the Swarm Blanket Earth Station Application Form 312 (File Number SES-LIC-INTR2019-02413, Response to E.50) does not indicate that the subscriber terminals will receive (listen) in the 148-149.9 MHz band, but rather they are listed as receiving only in the 137-138 MHz band. Thus, it is not clear how they would "listen-before-talk" for transmissions in the 148-149.9 MHz band.

interference scenarios (both interference to other systems *and* self-interference) including: interference to unintended satellite receivers (both intra-system, and inter-system); duplicative intra-system MES channel assignments that would jam the intended satellite receiver; and interference to the intended satellite receiver on the selected channel from foreign (other system) transmitters located in the satellite footprint but not within the reception radius of the intended Swarm transmitting MES. And Swarm offers no technique whatsoever to limit interference to ORBCOMM from the satellite downlinks, which according to the Schedule S would operate throughout the 137-138 MHz band.

Swarm also vaguely claims that “[w]ith a larger constellation and access to more VHF channels, Swarm can better utilize satellite and frequency diversity to avoid harmful interference into other licensed commercial and government systems.”<sup>25</sup> However, the Amendment Application provides no details as to any proposed modified design features, capabilities, or operating techniques that might allow Swarm to “better” avoid harmful interference.

In fact, it is not even clear from the Amendment Application how many simultaneous carriers a Swarm satellite might be capable of supporting. Even assuming that a Swarm satellite can only support one simultaneous carrier, based on the ‘flexible’ deployment plan for Swarm’s proposed 300 satellite constellation provided in the Amendment Application, at mid latitudes, there could be approximately 10-12 Swarm satellites simultaneously in view at any given MES location. Assuming Swarm’s newly proposed nominal 50 kHz MES uplink bandwidth, this could mean that the Swarm system could require as much as 600 kHz of simultaneously available uplink spectrum for peak utilization of its proposed system – or even more if higher bandwidth

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<sup>25</sup> Amendment Application Narrative Exhibit at p. 35.

uplinks proposed by Swarm are accounted for. And because Swarm apparently will not be utilizing dedicated feeder links, it is not at all clear how it would be possible to coordinate Swarm's proposed feeder link operations (which in the case of the ORBCOMM system are continuous) in ORBCOMM's primary spectrum without unacceptable interference to ORBCOMM. In sum, Swarm has utterly failed to meet its obligation, codified in Section 25.142(a)(1) of the Commission's rules, to *demonstrate* that it will not cause unacceptable interference to ORBCOMM. Swarm's mere invocation of potential sharing techniques falls fatally far short of that regulatory obligation.

***The Potential for Unacceptable Interference is not Merely Unfounded Speculation***

As explained above, Swarm's unsubstantiated claims of avoiding unacceptable interference to and/or not "unduly affecting" ORBCOMM ring hollow. Indeed, the information Swarm does provide presents a clear potential for unacceptable interference to ORBCOMM. Under the Amendment Application, Swarm will be operating in the same spectrum as ORBCOMM. As explained above, even Swarm's claimed use of its CSMA/CA technique provides no protections to ORBCOMM, unless the Swarm user terminal is within relatively close proximity to an active ORBCOMM subscriber communicator or ORBCOMM gateway. Moreover, in contrast to ORBCOMM's 5 kHz subscriber uplink channels, Swarm's much wider channels -- nominally 50 kHz, but up to 258 kHz (or 259 kHz<sup>26</sup>) -- will exacerbate the potential for harmful interference as a result of a single Swarm uplink transmission terminal blocking access to and likely jamming active ORBCOMM transmissions on between 10 and 50 ORBCOMM subscriber uplink channels at one time.

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<sup>26</sup> Compare Exhibit n. 21 with Table 5.

Swarm also has entirely failed to demonstrate how it can share downlink spectrum licensed to ORBCOMM on a primary basis without causing harmful interference. Swarm suggests it can avoid interfering with the NOAA satellites in the 137-138 MHz band by operating in spectrum assigned to ORBCOMM that does not overlap with NOAA,<sup>27</sup> but Swarm fails to explain how it will avoid interfering with ORBCOMM. Moreover, Swarm's request in the Amendment Application to double the size of its constellation increases even further the risk of unacceptable interference to ORBCOMM because of the increased number of downlink transmissions that would be required to support the operation of a 300 satellite Swarm constellation.

Finally, ORBCOMM observes that the potential problem of Swarm causing unacceptable interference to ORBCOMM is further exacerbated by their request to waive the duty cycle and message duration limits applicable to the 148-149.9 MHz band reflected in footnote US323. The longer duration and more frequent uplink transmissions by Swarm in the 148-149.9 MHz band would significantly increase the potential interference to the ORBCOMM transmissions, as well as increasing the blocking of open channels on which ORBCOMM could operate. The bottom line is that Swarm's Amendment, far from showing that it will not cause unacceptable interference to ORBCOMM, instead demonstrates that there is a real risk that it will cause unacceptable interference to ORBCOMM's operations.

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<sup>27</sup> Amendment Application Narrative at p. 29:

Swarm is confident it can continue to protect NOAA operations upon grant of this application, which will make additional, nonoverlapping VHF frequencies newly available for Swarm satellite transmissions.

***The Commission Should Reject Swarm's Request for Waiver of Footnote US323***

The Amendment Application also includes a request for waiver of the limits that apply to user terminals operating in the 148-149.9 MHz band.<sup>28</sup> ORBCOMM will leave it to the Federal government users to address the risk of harmful interference to the government's terrestrial operations in the 148-149.9 MHz band from the proposed Swarm operations in excess of the US323 constraints. However, having been part of the negotiations with NTIA that led to the development of the footnote US323, ORBCOMM observes that unless the technology of the federal government usage has changed significantly, increasing MES transmission burst durations from 450 ms to 1700 ms could cause harmful interference to Federal users. The 450 ms limit was incorporated in US323 because Federal user spectrum managers agreed that such short bursts would not disrupt co-frequency push-to-talk terrestrial Federal radio operations, even if an NVNG MSS subscriber terminal transmitted operated on a channel in use by a nearby Federal user. On the other hand, if there have been changes to the Federal government users' technology and operations, then changes to footnote US323 should be addressed in the context of a rulemaking proceeding, because the changed circumstances with regard to sharing with Federal terrestrial users affect all NVNG MSS systems, not just Swarm. Moreover, any such changes should be explored in a rulemaking proceeding, because the different NVNG MSS subscriber terminal operating characteristics also affects sharing between NVNG MSS systems.

Indeed, as discussed above, Swarm's proposed operations pursuant to the requested waiver would adversely affect ORBCOMM, regardless of the impact on the Federal terrestrial users. The longer and more frequent subscriber transmissions by Swarm's terminals under the

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<sup>28</sup> Amendment Application Narrative at pp. 36-39.

requested waiver would exacerbate the problem of interference and constrain ORBCOMM's operations. In attempting to justify the waiver, Swarm ignores completely the negative impact on ORBCOMM, only baldly asserting that its increases in capacity from grant of the waiver would come “at no cost to incumbent *terrestrial use of the band*.”<sup>29</sup>

The Commission may grant a request for a waiver when: (i) the underlying purpose of the rule(s) would not be served or would be frustrated by application in the instant case, and a grant of the requested waiver would be in the public interest; or (ii) in view of the unique or unusual factual circumstances of the instant case, application of the rule(s) would be inequitable, unduly burdensome or contrary to the public interest, or the applicant has no reasonable alternative.<sup>30</sup> In light of the adverse effect on ORBCOMM, grant of the waiver would be contrary to the public interest. Moreover, there is nothing unique to Swarm's system that makes it inequitable or unduly burdensome to apply the constraints of US323 to Swarm. The Commission should deny Swarm's request because of its failure to justify a waiver under the Commission's standards.

### ***Conclusion***

In light of the failure of Swarm to demonstrate that it would not cause unacceptable interference to ORBCOMM as required by the Commission's rules, the Commission should deny or dismiss the Amendment Application. In addition, the Commission should deny Swarm's

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<sup>29</sup> Amendment Application Narrative at p. 38 (emphasis added).

<sup>30</sup> See *AT&T Wireless Services, Inc. et al. v. Federal Communications Commission*, No. 00-1304 (D.C. Cir. 2001), citing *Northeast Cellular Tel. Co. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990). *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969), cert. denied, 409 U.S. 1027 (1972).

request for waiver of footnote US323. As explained above, grant of the Amendment Application and grant of the requested waiver would disserve the public interest.

Respectfully submitted,



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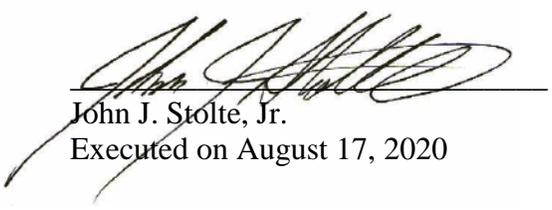
Counsel for ORBCOMM Inc.

August 17, 2020

## DECLARATION

I, John J. Stolte, Jr., hereby declare as follows:

1. I am Executive Vice-President of Technology and Operations at ORBCOMM Inc.
2. I have reviewed the foregoing Petition to Dismiss or Deny of ORBCOMM License Corp. (the "Petition").
3. I declare under penalty of perjury that the facts set forth in the foregoing Petition (except for those of which official notice may be taken) to support the specific relief requested are true and correct to the best of my knowledge, information and belief.



John J. Stolte, Jr.

Executed on August 17, 2020

## CERTIFICATE OF SERVICE

I hereby certify that on this 17<sup>th</sup> day of August, 2020, I caused a true and correct copy of the foregoing “PETITION TO DISMISS OR DENY” to be sent by first class mail, postage prepaid, and email to the following:

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