

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

In the Matter of
Onsat Petition for Waiver to Permit Routine
Licensing of 3.7 Meter Transmit and Receive
Stations at C-Band
File No. SAT-PDR-19990910-00091

ORDER

Adopted: December 13, 2000

Released: December 14, 2000

By the Chief, International Bureau:

I. INTRODUCTION

1. By this Order, we deny a petition for waiver filed by Onsat Network Communications, Inc. (Onsat) for routine licensing of 3.7-meter, C-band earth station antennas. We note, however, that the Commission's rules currently allow Onsat to implement its proposed service in a reasonable time frame. By this action, we ensure that earth station operators, space station operators, and terrestrial wireless operators that comply with the Commission's rules will not suffer harmful interference, without unreasonably limiting Onsat's efforts to provide high speed Internet service in rural America and on tribal lands.

II. BACKGROUND

2. Onsat plans to provide high speed Internet service in rural America and on tribal lands, a goal that has been enthusiastically endorsed by the Commission. To help it to implement its proposal, on September 10, 1999, Onsat filed a petition for waiver of section 25.212(d) to permit C-band 3.7-meter antennas to be "routinely licensed." Section 25.212(d) provides that C-band antennas must be at least 4.5

1 Onsat Petition at 1.

2 Extending Wireless Telecommunications Services to Tribal Lands, Report and Order and Further Notice of Proposed Rule Making, WT Docket No. 99-266, 15 FCC Rcd 11794 (2000); Federal-State Joint Board on Universal Service, Promoting Deployment and Subscribership in Unserved and Underserved Areas, Including Tribal and Insular Areas, Report and Order, CC Docket No. 96-45, 15 FCC Rcd 12208 (2000).

3 By C-band, we refer specifically to the 3700-4200 MHz downlink and 5925-6425 MHz uplink frequency bands. These bands are allocated to the Fixed-Satellite Service (FSS) and are also referred to as the 4/6 GHz bands. The C-band is also shared with the Fixed Service on a co-primary basis.

4 Onsat Petition at 10-13. Onsat's petition included two requests. In addition to its petition for waiver, Onsat also petitioned for a declaratory ruling that section 25.115 of the Commission's rules permits

meters in diameter to qualify for routine licensing. In this Order, we address Onsat's waiver petition for routine licensing of 3.7-meter C-band antennas.<sup>5</sup> Onsat's petition for waiver was placed on public notice, and was unopposed.<sup>6</sup>

### III. DISCUSSION

3. Section 25.212(d) of the Commission's rules establishes a minimum antenna aperture size of 4.5 meters for "routinely-licensed" earth stations operating in the C-band.<sup>7</sup> The Commission has determined that earth station antennas that are at least 4.5 meters in size and that meet specified power limits can operate within a uniform two-degree spacing environment without causing harmful interference to adjacent satellites.<sup>8</sup> Thus, the Commission "routinely" licenses these antennas without extensive technical scrutiny. The Commission's rules also recognize that smaller antennas may also be able to operate in a two-degree spacing environment without causing unacceptable interference to adjacent satellite systems, but generally require that applications involving the smaller antennas be resolved on a case-by-case technical analysis basis.

4. Onsat asserts that 3.7-meter antennas should be licensed routinely in the C-band because 3.7-meter dishes operating in the C-band have less potential for interference than do 1.2-meter antennas at Ku-band,<sup>9</sup> which are routinely licensed. Onsat also maintains that routine-licensing for 3.7-meter C-band antennas is in the public interest because rain fade attenuation does not significantly affect C-band signals,

---

blanket-licensing of 3.7-meter antennas in the C-band. Onsat Petition at 9-10. In response to the petition for declaratory ruling, the Commission initiated a rulemaking to consider blanket licensing in the C-band. FWCC Request for Declaratory Ruling on Partial-Band Licensing of Earth Stations in the Fixed-Satellite Service that Share Terrestrial Spectrum, Notice of Proposed Rulemaking, IB Docket No. 00-203, FCC 00-369 (released Oct. 24, 2000) (*FWCC/Onsat NPRM*) at para. 83.

<sup>5</sup> In the *FWCC/Onsat NPRM*, the Commission decided to consider Onsat's waiver request in a separate licensing Order, and to consider more general issues of what antenna sizes and power densities may be licensed routinely in a future rulemaking. *FWCC/Onsat NPRM*, at para. 10 n.13.

<sup>6</sup> The Fixed Wireless Communications Coalition (FWCC) opposed Onsat's petition for declaratory ruling, but did not comment on Onsat's request for a waiver of section 25.212(d) to permit routine licensing of 3.7-meter antennas in the C-band.

<sup>7</sup> 47 C.F.R. § 25.212(d). Section 25.212(d) also sets power limits for narrowband transmissions in the FSS in the C-band.

<sup>8</sup> The Commission originally adopted a minimum antenna size of 9 meters for C-band operations. This was later reduced to 4.5 meters. Routine Licensing of Earth Stations in the 6 GHz and 14 GHz Bands Using Antennas Less than 9 Meters and 5 Meters in Diameter, Respectively, for Both Full Transponder and Narrowband Transmissions, Declaratory Order, 2 FCC Rcd 2149, 2149 (para. 2) (Com. Car. Bur. 1987) (*1987 VSAT Order*).

<sup>9</sup> Onsat Petition at 13-14 and App. C. By Ku-band, we refer specifically to the 11700-12200 MHz downlink and 14000-14500 MHz uplink frequency bands. These paired bands are allocated exclusively to the Fixed-Satellite Service and are also referred to as the 12/14 GHz bands.

as it does higher frequencies, and the C-band offers some digital compression capabilities.<sup>10</sup> According to Onsat, it would have to use an antenna larger than 3.7 meters in parts of the country where rain fade is worse if it operated in the Ku-band in order to be able to offer a high-speed Internet data service with 99.99 percent signal availability.<sup>11</sup> Finally, Onsat claims that C-band space segment capacity is less expensive to lease for partial transponder service than similar Ku-band service.<sup>12</sup>

5. Rules may be waived if there is good cause to do so.<sup>13</sup> 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.<sup>14</sup> Circumstances that would justify a waiver include "considerations of hardship, equity, or more effective implementation of overall policy."<sup>15</sup> Moreover, if the Commission grants waivers, it must identify and articulate reasonable standards that are predictable, workable, and not susceptible to discriminatory application.<sup>16</sup> Generally, the Commission may grant a waiver of its rules in a particular case only if the relief requested would not undermine the policy objective of the rule in question, and would otherwise serve the public interest.<sup>17</sup>

6. We find that Onsat has not shown good cause for waiver of section 25.212(d) to permit routine licensing of 3.7-meter antennas in the C-band for two reasons. First, granting Onsat's waiver request would undermine the Commission's policy objectives. Second, Onsat has not shown that it faces any unusual hardship that would warrant a waiver.

7. Granting Onsat's waiver request would undermine the Commission's policy objectives. The 3.7-meter antenna Onsat plans to use does not meet the antenna gain pattern requirements contained in sections

---

<sup>10</sup> Onsat Petition at 11-12 and Table 1. Table 1 is a comparison between the C-band and the Ku-band for rain attenuation in cities in all eight Rain Rate Regions of the CONUS based on the "Crane Rain Rate Model."

<sup>11</sup> Onsat Petition at 12.

<sup>12</sup> Onsat Petition at 9.

<sup>13</sup> See section 1.3 of the Commission's Rules, 47 C.F.R. § 1.3. See also *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969) (*WAIT Radio*); *Northeast Cellular Telephone Co. v. FCC*, 897 F.2d 1166 (D.C. Cir. 1990) (*Northeast Cellular*).

<sup>14</sup> *Northeast Cellular*, 897 F.2d at 1166. See also *Comsat Corporation, Petition for Partial Relief from the Current Regulatory Treatment of Comsat World Systems' Switched Voice, Private Line, and Video and Audio Services*, Order, 11 FCC Rcd 9622, 9625 (para. 10) (1996); *Petition of General Communications, Inc. for a Partial Waiver of the Bush Earth Station Policy*, Memorandum Opinion and Order, 11 FCC Rcd 2535, 2536 (para. 4) (Int'l Bur. 1996).

<sup>15</sup> *WAIT Radio*, 418 F.2d at 1159.

<sup>16</sup> *Northeast Cellular*, 897 F.2d at 1166.

<sup>17</sup> *WAIT Radio*, 418 F.2d at 1157; *Dominion Video Satellite, Inc., Order and Authorization*, 14 FCC Rcd 8182, 8185 (para. 5) (Int'l Bur., 1999) (*Dominion Video*).

25.209(a) and (b).<sup>18</sup> The gain of any earth station antenna<sup>19</sup> must fall within the limits defined by the equations set forth in sections 25.209(a) and (b) to qualify for routine licensing. In other words, the main lobes and side lobes of an antenna must be less than the limits specified in the equations cited in section 25.209.<sup>20</sup> Allowing an antenna to operate with a main lobe and side lobes that go beyond the section 25.209 envelope, without making some other adjustment such as reducing power levels, creates a potential for unacceptable interference to adjacent satellite systems and fixed service stations.<sup>21</sup> Therefore, we will review Onsat's license applications for 3.7-meter antennas for use in the C-band on a case-by-case basis rather than grant licenses for these types of antennas to Onsat routinely.

8. Furthermore, Onsat has not shown that it faces any unusual hardship that would warrant granting a waiver of the Commission's rules.<sup>22</sup> There is nothing in Part 25 that prevents Onsat from deploying its service in a reasonable time frame. Neither section 25.209 nor section 25.212(d) prohibits earth station licensees from using antennas less than 4.5 meters in diameter. Rather, the rules require applicants to demonstrate that such antennas will not cause unacceptable interference.<sup>23</sup> Onsat has already demonstrated that its particular 3.7-meter antenna will not cause unacceptable interference into adjacent satellite systems when communicating with the Telstar 5 satellite at 97° W.L.<sup>24</sup> We are able to discern that

---

<sup>18</sup> The side lobes of the 3.7-meter C-band antenna proposed by Onsat exceed those antenna gain pattern requirements at +/- 1.0 degrees off-axis from the boresight.

<sup>19</sup> The gain of an antenna is "the ratio, usually expressed in decibels, of the power required at the input of a loss-free reference antenna to the power supplied to the input of the given antenna to produce, in a given direction, the same field strength or the same power flux-density at the same distance. When not specified otherwise, the gain refers to the direction of maximum radiation." 47 C.F.R. § 2.1. In other words, gain refers to an antenna's ability to collect, concentrate, and direct energy in a particular fashion, such as a beam.

<sup>20</sup> Antennas are generally shaped like parabolas, or in other words, like large, curved bowls. The "axis," or boresight, is the line running through the center of the bowl and perpendicular to the plane of the edge of the bowl. The "main beam" or "main lobe" is the energy generated in the direction of the axis. The "off-axis" angle is the angle formed by the axis and another line running through the center of the bowl or the "boresight." The energy transmitted from an antenna forms "ripples," alternately increasing and decreasing in magnitude as the off-axis angle increases. These ripples are called "side lobes."

<sup>21</sup> See 2000 Biennial Regulatory Review -- Streamlining and Other Revisions of Part 25 of the Commission's Rules Governing the Licensing of, and Spectrum Usage by, Satellite Network Earth Stations and Space Stations, Notice of Proposed Rulemaking, IB Docket No. 00-248, FCC 00-435 (released Dec. 14, 2000), at para. 15.

<sup>22</sup> See NYNEX Telephone Companies, Memorandum Opinion and Order, 9 FCC Rcd 1608, 1612 (para. 23) (1994); Petitions for Waiver of Transport Rate Structure and Pricing Requirements, Order, 9 FCC Rcd 796, 800-01 (paras. 10-11) (Com. Car. Bur., 1993); BPS Telephone Co., Petition for Waiver of section 69.605(c) of the Commission's Rules, Memorandum Opinion and Order, 12 FCC Rcd 4702, 4706 (para. 11) (Com. Car. Bur., Accounting and Audits Div. 1997) (Orders denying petitions for waiver because petition failed to show that it faced disproportionate hardship).

<sup>23</sup> 47 C.F.R. § 25.209(f).

<sup>24</sup> Onsat Petition, Exhibit 2.

the 3.7-meter antenna will not cause unacceptable interference because Onsat has provided an affidavit from Loral, the operator of the Telstar 5 satellite, to that effect.<sup>25</sup> Loral's affidavit is sufficient to show that it has negotiated coordination agreements with its neighboring satellite systems taking Onsat's non-routine operations into account, and that Loral will continue to take Onsat's non-routine operations into account in future coordination discussions. Based on the Loral affidavit, and pursuant to our case-by-case method of review, we have already granted a license to Onsat on a case-by-case basis to operate a single transmit/receive 3.7-meter antenna in the C-band in Red Mesa, Arizona.<sup>26</sup>

9. In addition, under section 25.117, Onsat is permitted to apply to modify its Red Mesa license to add technically identical antennas to communicate with Telstar 5 at 97° W.L. Onsat may apply to add these technically identical antennas anywhere in the United States, but it may not file its modification application for those antennas until it has completed coordination with terrestrial wireless operators, and it may not operate those antennas until it has received a grant of its application by the Commission.<sup>27</sup> Because we have already examined Onsat's demonstration supporting its first 3.7-meter antenna, and such antennas have been taken into account by Onsat's satellite service provider, we will not require Onsat to re-submit its antenna patterns for the non-routine antennas with each subsequent modification application. A statement from Onsat that the 3.7-meter antennas are technically identical to those already licensed to Onsat will be sufficient.<sup>28</sup>

10. Loral's affidavit is specific to Onsat's proposed operation, and does not show that Loral has coordinated communications between Telstar 5 and any non-routine antenna operated by any other earth station licensee. Thus, nothing in this Order or in Onsat's Red Mesa license will be deemed to support an application for anyone other than Onsat to use a 3.7-meter antenna. We further note that Onsat must comply with section 25.209(e) of the Commission's rules, which prohibits the imposition of limitations upon the operation, location, or design of any terrestrial station, any other earth station, or any space station beyond those limitations that would be expected to be imposed by an earth station with a conforming antenna.<sup>29</sup>

---

<sup>25</sup> Statement of Robert C. Draper, Principal Engineer, Satellite Services Engineering, Loral Skynet (attached as Exhibit 2 to Onsat's September 10, 1999 petition).

<sup>26</sup> SES-LIC-20000801-01226, granted October 13, 2000, callsign: E000369.

<sup>27</sup> The Commission recently adopted a Notice of Proposed Rulemaking. If the Commission adopts the proposals in that Notice, Onsat and other earth station operators would be permitted to obtain blanket licenses for C-band earth stations. Among other things, blanket licensing would allow a licensee to begin operating a C-band earth station as soon as (1) it has been coordinated with terrestrial wireless operators, and (2) the 30-day public notice period is complete, provided no oppositions have been filed. In other words, the licensee would not have to wait for the Commission to issue a license modification, as Onsat must do under the current rules.

<sup>28</sup> Onsat has requested a waiver of the fees that would be associated with its applications. We will not consider any Onsat application to modify its Red Mesa license until we have resolved this fee waiver issue.

<sup>29</sup> 47 C.F.R. § 25.209(e).

**IV. ORDERING CLAUSES**

11. Accordingly, IT IS ORDERED, pursuant to section 1.3 of the Commission's rules, 47 C.F.R. § 1.3, that the petition for waiver of section 25.212(d) of the Commission's rules, 47 C.F.R. § 25.212(d), is DENIED.

12. This Order is issued pursuant to section 0.261 of the Commission's rules on delegated authority, 47 C.F.R. § 0.261, and is effective upon release. Petitions for reconsideration under section 1.106 or applications for review under section 1.115 of the Commission's rules, 47 C.F.R. §§ 1.106, 1.115, may be filed within 30 days of the date of the release of this Order. (See 47 C.F.R. § 1.4(b)(2).)

FEDERAL COMMUNICATIONS COMMISSION

Donald Abelson  
Chief, International Bureau