

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

In the Matter of	)	
	)	
contactMEO Communications, LLC	)	File Nos. SAT-LOA-19971222-00222
	)	SAT-LOA-20040322-
	)	00234/35/36/37 <sup>1</sup>
	)	SAT-AMD-20040719-00141
	)	SAT-AMD-20040322-00057
	)	SAT-AMD-20031030-00317
For Authority to Launch and Operate a Non-Geostationary Orbit Fixed-Satellite System in the Ka-band Frequencies	)	Call Signs: S2346, S2680, S2681, S2682, S2683
	)	

**ORDER AND AUTHORIZATION**

Adopted: April 14, 2006

Released: April 14, 2006

By the Chief, International Bureau:

**I. INTRODUCTION**

1. By this Order, we grant contactMEO Communications, LLC (contactMEO) authority for a satellite system consisting of three non-geostationary satellite orbit (NGSO) satellites and four geostationary satellite orbit (GSO) satellites to provide fixed-satellite service (FSS) in the Ka-band.<sup>2</sup> Specifically, we authorize contactMEO to construct three NGSO FSS satellites capable of operating in the 18.8-19.3 GHz and 28.6-29.1 GHz frequency bands on a primary basis, in the 29.5-30.0 GHz frequency band on a secondary basis, and in the 19.7-20.2 GHz frequency band on a non-conforming basis.<sup>3</sup> We

<sup>1</sup> For administrative purposes, File Nos. SAT-LOA-20040322-00234/00235/00236/00237 were generated by the International Bureau's File System (IBFS) to obtain Call Signs for each of contactMEO's four proposed GSO satellites. The Schedule S for these satellites is in File No. SAT-AMD-20040322-00057.

<sup>2</sup> In December 2003, the applicant @contact LLC, a Colorado limited liability company, submitted a notice of name change -- to contactMEO Communications, LLC. Letter to Marlene H. Dortch, FCC from James M. Talens, Counsel for contactMEO Communications, LLC (filed December 2, 2003). The term "Ka-band" in this order refers to the space-to-Earth (downlink) communications in the 17.7-20.2 GHz band and the corresponding Earth-to-space (uplink) communications in the 27.5-30.0 GHz band.

<sup>3</sup> For the purposes of this Order and Authorization, we use the terms "primary" and "secondary" as the Commission did when it adopted the Ka-band plan. See Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed-Satellite Services, *Third Report and Order*, CC Docket No. 92-297, 12 FCC Rcd 22310 (1997) (*Ka-band Third Report and Order*). Thus, space stations operating in primary services are protected against interference from stations of secondary services. Stations

(continued...)

also authorize contactMEO to construct, launch, and operate four GSO FSS satellites in the 28.6-29.1 GHz frequency band on a secondary basis, and in the 18.8-19.3 GHz frequency band on a non-conforming basis. This authorization gives contactMEO an opportunity to provide consumers access to a variety of advanced broadband and interactive satellite communications services.

2. At this time, however, we do not authorize contactMEO to launch or operate its NGSO satellites pending the development of additional information concerning contactMEO's plans for end-of-life disposal of its NGSO spacecraft.<sup>4</sup> We address issues relating to contactMEO's proposed NGSO FSS operations in this Order so we will be in a position to act expeditiously upon its request for launch and operating authority. In addition, we deny contactMEO's request to conduct transfer orbit and emergency mode telemetry, tracking and control operations in the C-band frequencies. We also deny contactMEO's request for a waiver of the bond requirement.

## II. BACKGROUND

3. In May 1997, the International Bureau licensed 13 GSO FSS and one NGSO FSS applicant to operate satellite systems as part of the first Ka-band processing round.<sup>5</sup> Consistent with the Commission's 1996 decision to divide the 27.5-30.0 GHz portion of the Ka-band among several services, the Bureau authorized the GSO FSS systems in one range of Ka-band spectrum and the NGSO FSS system in another.<sup>6</sup> In October 1997, the Bureau established a second processing round for NGSO FSS Ka-band systems.<sup>7</sup> In response to the Public Notice, six applications were filed. Four applicants subsequently withdrew their applications.<sup>8</sup> contactMEO is one of the two remaining applicants.<sup>9</sup> In 1997, the Commission also adopted its *Ka-Band Third Report and Order* establishing technical requirements,

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*Order*, CC Docket No. 92-297, 12 FCC Rcd 22310 (1997) (*Ka-band Third Report and Order*). Thus, space stations operating in primary services are protected against interference from stations of secondary services. Stations operating in the secondary service cannot cause harmful interference to or claim protection from harmful interference from stations of a primary service. Co-primary services have equal rights to operate in particular frequencies. Non-conforming services may be provided only on a non-harmful interference basis to any Federal, non-Federal, or internationally authorized service and may not claim interference protection from those services or any non-conforming services previously authorized on a non-harmful interference basis.

<sup>4</sup> See paragraph 47, below.

<sup>5</sup> Assignment of Orbital Locations to Space Stations in the Ka-band, *Order*, 13 FCC Rcd 1030 (Int'l Bur. 1997). See also, Teledesic Corp., *Order and Authorization*, 12 FCC Rcd 3154 (Int'l Bur. 1997) (authorizing Teledesic Corp. to launch and operate a NGSO FSS system in the Ka-band). Teledesic subsequently surrendered its authorization, Letter to Marlene H. Dortch, Secretary, FCC, from Mark A. Grannis, Counsel to Teledesic (June 27, 2003).

<sup>6</sup> Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services, *First Report and Order and Fourth Notice of Proposed Rulemaking*, 11 FCC Rcd 19005 (1996) (*Ka-Band Plan Order*).

<sup>7</sup> See *Public Notice* Satellite Policy Branch Information: Satellite Applications Accepted for filing in the Ka-band, Cut-Off Established for Additional Applications in the 28.35-28.6 GHz, 29.1-30 GHz, 17.7 - 18.8 GHz, and 19.3 - 20.2 GHz Frequency Bands, Report No. SPB-106, 13 FCC Rcd 8020 (Int'l Bur. 1997).

<sup>8</sup> Motorola Global Communications, Inc., Hughes Communications, Inc., Lockheed Martin Corp., and SkyBridge II, LLC.

<sup>9</sup> The other applicant is Northrop Grumman Space and Mission Systems Corporation, File Nos. SAT-LOA-19970904-00080/84; SAT-LOA-19971222-00219; SAT-AMD-20031104-00324; SAT-AMD-20040312-00030/34; SAT-AMD-20040719-00136/40.

licensing qualifications, and service rules for GSO FSS and NGSO FSS systems in the Ka-band.<sup>10</sup> At that time, the Commission deferred establishing principles by which multiple NGSO FSS systems could share the NGSO-designated portion of the spectrum, but stated that all Ka-band NGSO FSS licensees are expected to bear some portion of the technical and operational constraints necessary to accommodate multiple “non-homogeneous” NGSO FSS systems.<sup>11</sup>

4. In July 2003, the Commission adopted a sharing method and established the parameters for Ka-band NGSO FSS operations in the *NGSO Report and Order*.<sup>12</sup> Under this sharing method, all Ka-band NGSO FSS systems will have access to the entire NGSO-designated spectrum, except during in-line interference events. When two NGSO non-Federal FSS systems cannot avoid an in-line interference event, the operators must divide the available spectrum equally for the duration of the event.<sup>13</sup> The *NGSO Report and Order* also adopted a technical definition to support the sharing method, a default mechanism, and various service rules.

5. Initially, contactMEO proposed to construct, launch and operate an NGSO FSS satellite system consisting of 16 operational satellites, plus four orbiting spares, equally spaced in three planes in 10,400 kilometer circular medium earth orbit (MEO).<sup>14</sup> contactMEO proposed to use the 28.6-29.1 GHz and 18.8-19.3 GHz frequency bands, which the Commission had designated for NGSO FSS systems. It also proposed to use the 29.5-30.0 GHz and 19.7-20.2 GHz frequency bands on a non-interference basis, spectrum the Commission designated to GSO FSS systems. In March 2004, contactMEO amended its application to reduce the number of satellites from 16 to seven, and to change the orbital configuration to use three satellites in highly elliptical orbits (HEO) and four Ka-band satellites in geostationary satellite orbits.<sup>15</sup> As set forth in the amended application, contactMEO proposes to operate its three HEO satellites in the 28.6-29.1 GHz (Earth-to-space) and 18.8-19.3 GHz (space-to-Earth) NGSO-designated frequency bands, on a primary basis, and in the 19.7-20.2 GHz and 29.5-30.0 GHz GSO designated bands on a “secondary, non-harmful interference basis.” contactMEO proposes to place its GSO satellites at four

<sup>10</sup> *Ka-Band Third Report and Order*, 12 FCC Rcd 22310. In this *Order*, the Commission observed that the 27.5-30.0 GHz and 17.7-20.2 GHz band is allocated internationally and domestically for a number of different uses. To address these different uses, a band plan was adopted that divides the bands in to several segments, each of which were designated for primary use for LMDS, GSO FSS, NGSO FSS, or MSS feeder link operations. *Id.* at 22366.

<sup>11</sup> *Ka-band Third Report and Order*, 12 FCC Rcd at 22325.

<sup>12</sup> 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 (2003) (*NGSO Report and Order*). See also Establishment of Policies and Service Rules for the Non-Geostationary Satellite Orbit, Fixed-Satellite Service in the Ka-band, *Notice of Proposed Rulemaking*, 17 FCC Rcd 2807 (2002) (*NGSO NPRM*).

<sup>13</sup> *NGSO Report and Order*, 18 FCC Rcd at 14717.

<sup>14</sup> contactMEO NGSO FSS Application, File No. SAT-LOA-19971222-00222 (*contactMEO Application*) at 2. Subsequent to filing its application, contactMEO filed additional information to clarify, support or correct the application: Erratum, filed February 18, 1998; Second Erratum to Application, filed June 11, 1999; Supplement to Application filed May 21, 1999; Correction of Ownership Information, filed June 19, 1998. In October 2003, contactMEO amended this application to provide an orbital debris mitigation plan. contactMEO LLC, SAT-AMD-20031030-00317 (filed October 30, 2003) (*contactMEO October Amendment*). We also note that contactMEO filed supplementary information with the International Telecommunication Union (ITU) in response to an ITU request for information to be used in developing software to prove compliance with certain power limits. See Letter from Kathryn O'Brien, Chief, Strategic Analysis and Negotiations Division, International Bureau, FCC, to The Director, Radiocommunication Bureau, International Telecommunication Union, (Sept. 25, 2002) (cover submission on @contact) (@contact. 2002 CR/176 Filing); March 26, 2002 ITU-BR Circular letter CR/176.

<sup>15</sup> contactMEO Communications LLC, Application for Authority to Launch and Operate a Non-Geostationary Orbit Fixed Satellite System in the Ka-Band, File No. SAT-AMD-20040322-00057, Filed March 22, 2004 (*contactMEO March Amendment*).



orbit locations, 83° W.L., 121° W.L., 34° E.L. and 130° E.L., using the 18.8-19.3 GHz and 28.6-29.1 GHz NGSO-designated frequency bands on a “secondary, non-harmful interference basis.”<sup>16</sup> In addition, contactMEO requests waivers of several Commission rules, including the performance bond requirement, and authority to operate its transfer orbit and emergency mode telemetry, tracking, and control (TT&C) functions in the 3650-3700 MHz and 6425-6525 MHz frequencies. contactMEO suggests that we treat its proposed seven-satellite system as an NGSO constellation.<sup>17</sup>

6. On May 18, 2004, the International Bureau’s Satellite Division dismissed the amended application as incomplete on two grounds.<sup>18</sup> First, the NGSO portion of the application did not comply with section 25.145(c)(3) of the Commission’s rules. This rule requires NGSO applicants to submit a casualty risk assessment if, as contactMEO proposed, “planned post-mission disposal involves atmospheric reentry of the spacecraft.”<sup>19</sup> Second, contactMEO failed to submit the required interference analysis demonstrating that its proposed GSO FSS satellites were compatible with the Commission’s two-degree orbital spacing environment.<sup>20</sup> The Satellite Division also noted that contactMEO had requested a waiver to operate GSO FSS satellites in spectrum designated for NGSO FSS use only, and cautioned contactMEO that it had failed to demonstrate that its proposed GSO FSS satellites could operate compatibly with NGSO FSS systems in this spectrum.<sup>21</sup>

7. Subsequently, the Satellite Division determined that the Commission’s rules regarding the casualty risk assessment and two-degree interference analysis were subject to reasonable but conflicting interpretations.<sup>22</sup> Consequently, the Bureau issued Public Notices to clarify these requirements.<sup>23</sup> In the Notices, the Bureau stated that it would dismiss applications that do not contain this information on a going-forward basis, but that it would afford pending applicants an opportunity to amend their applications to comply with the clarified requirements. Thus, the Division reinstated contactMEO’s application, on its own motion, and gave contactMEO an opportunity to file an amendment.<sup>24</sup> In response, contactMEO submitted a two-degree interference analysis and a revised orbital debris mitigation plan and casualty risk assessment.<sup>25</sup> contactMEO also submitted additional technical information to support its claim that the contactMEO GSO FSS satellites will not cause interference to the NGSO FSS satellites of other non-Federal systems. In response to a Division request,

<sup>16</sup> *contactMEO March Amendment*, at 16, 17.

<sup>17</sup> *contactMEO March Amendment*, at 5.

<sup>18</sup> Letter to David M. Drucker, Manager, contactMEO Communications, LLC, from Thomas S. Tycz, Chief, Satellite Division, FCC, dated May 18, 2004, 19 FCC 8867 (Sat. Div., Int’l Bur. 2004) (*May 18 Letter*).

<sup>19</sup> 47 C.F.R. § 25.145(c)(3). See Communications LLC, Amended Application, File No. SAT-AMD-20031030-00317.

<sup>20</sup> 47 C.F.R. § 25.140(b)(2).

<sup>21</sup> *May 18 Letter*, at 2.

<sup>22</sup> Letter to David M. Drucker, Manager, contactMEO Communications, LLC from Thomas S. Tycz, Chief, Satellite Division, FCC, dated June 16, 2004, 19 FCC Rcd 8867 (Sat. Div., Int’l Bur. 2004) (*June 16 Letter*).

<sup>23</sup> *Public Notice*, International Bureau Satellite Division Information, Report No. SPB-208, Orbital Debris Mitigation: Clarification of 47 C.F.R. sections 25.143(b), 25.145(c)(3), 25.146(i)(4) and 25.217(d) Regarding Casualty Risk Assessment for Satellite Atmospheric Reentry, 19 FCC Rcd 10714 (Int’l Bur., Sat. Div., 2004) (*Orbital Debris Public Notice*); *Public Notice*, International Bureau Satellite Division Information: Clarification of 47 CFR § 25.140(B)(2), Space Station Application Interference Analysis, Report No. SPB-207, 19 FCC Rcd 10652 (Int’l Bur., Sat. Div., 2004). See also Mobile Satellite Ventures Subsidiary LLC, *Order and Authorization*, DA 05-1492 (Int’l Bur. May 23, 2005) paras. 10-11.

<sup>24</sup> *June 16 Letter*.

<sup>25</sup> contactMEO Communications, LLC, File No. SAT-AMD-20040719-00141 (*contactMEO July Amendment*).

it also submitted information regarding its efforts to avoid in-orbit collisions with a similar system proposed by Northrop Grumman Space & Mission System Corporation.<sup>26</sup> Thereafter, the Commission's orbital debris mitigation disclosure rules became effective.<sup>27</sup> contactMEO amended its application to provide additional technical information in accordance with the new rules.<sup>28</sup>

8. In August 2004, we placed contactMEO's application, as amended, on Public Notice.<sup>29</sup> The Alaska Telephone Association, a trade association composed of rural local exchange carriers, comments that granting contactMEO's application will facilitate access to affordable broadband service to rural Alaskans.<sup>30</sup> EchoStar Satellite LLC (EchoStar) and SES Americom, Inc. (SES Americom) filed petitions opposing contactMEO's application. EchoStar argues that because we permitted contactMEO to provide additional technical showings in support of its application instead of dismissing it, that we should have done the same with applications EchoStar filed proposing similar GSO FSS operations.<sup>31</sup> Alternatively, EchoStar suggests that the Bureau should grant its petition for reconsideration of the dismissal of its applications, reinstate them, and process the applications in accordance with the Commission's "first-come, first-served" policy.<sup>32</sup> Under this policy, according to EchoStar, EchoStar's applications are first-in-time and thus have processing priority over contactMEO's application, which seeks to use two of the orbital locations that EchoStar requested in the same frequency band.<sup>33</sup>

9. EchoStar further states that the Commission should grant a Petition for Rulemaking it filed to redesignate the NGSO FSS spectrum in the 18.8-19.3 GHz and 28.6-29.1 GHz bands for both GSO and NGSO operations, and to develop sharing criteria.<sup>34</sup> EchoStar claims that addressing GSO/NGSO sharing issues would avoid future disputes and would effectively manage available

<sup>26</sup> Letter to Marlene Dortch, Secretary, Federal Communications Commission, from James M. Talens, Attorney for contactMEO Communications, LLC, dated May 12, 2005.

<sup>27</sup> Mitigation of Orbital Debris, *Second Report and Order*, 19 FCC Rcd 11567 (2004). See also, *Public Notice*, International Bureau Satellite Division Information, Disclosure of Orbital Debris Mitigation Plans, Including Amendment of Pending Applications, Report No. SPB-112 (Oct. 13, 2005) (*October Orbital Debris Public Notice*)

<sup>28</sup> contactMEO Communications LLC, File No. SAT-AMD-20051118-00243, filed Nov. 18, 2005 (*contactMEO November amendment*).

<sup>29</sup> Policy Branch Information, Satellite Applications Accepted for Filing, *Public Notice*, Report No. SAT-00234 (August 13, 2004). In March 1999, we invited comment on the initial NGSO FSS applications. *Public Notice*, Ka-Band Satellite Applications Accepted For Filing, Report No. SAT-00012 (March 16, 1999). Several parties commented on contactMEO's original proposal. In general, these filings related to contactMEO's technical showing and its financial qualifications waiver, issues resolved or rendered moot by subsequent filings by contactMEO and/or changes in our rules. We note, however, that SkyBridge II, LLC, a former Ka-band NGSO FSS applicant, asserted that contactMEO's application should be denied for failing to satisfy section 706 of the Telecommunications Act of 1996, 47 U.S.C. § 157. This section directs the Commission to "encourage the deployment, on a reasonable and timely basis of advanced telecommunications capability for all Americans." We find that contactMEO's proposed system provides the Commission with the opportunity to further this goal. In addition, GE Americom, Inc. (now SES Americom), filed a petition to defer all NGSO FSS applications in the Ka-band until co-frequency sharing issues between GSO and NGSO FSS systems are resolved. The conditions in this authorization address these concerns.

<sup>30</sup> Letter to Marlene H. Dortch, Secretary, FCC, from James Rowe, Executive Director, Alaska Telephone Association, dated May 12, 2004.

<sup>31</sup> Petition to Deny of EchoStar Satellite LLC, at 6 (Filed Sept. 13, 2004) (*EchoStar Petition to Deny*).

<sup>32</sup> *EchoStar Petition to Deny*, at 7.

<sup>33</sup> *EchoStar Petition to Deny*, at 7.

<sup>34</sup> *EchoStar Petition to Deny*, at 9.

spectrum.<sup>35</sup>

10. SES Americom asserts that contactMEO's proposal conflicts with the Commission's 28 GHz band plan, and that contactMEO has not justified a waiver of the plan.<sup>36</sup> Until the Commission determines whether, and under what conditions NGSO FSS systems can operate in GSO Ka-band spectrum on a secondary basis, SES Americom states that we cannot consider contactMEO's application.<sup>37</sup> SES Americom also rejects contactMEO's assertion that its GSO FSS satellites should be treated as NGSO satellites for purposes of its system, calling it a "creative attempt" to change the nature of the GSO spacecraft or orbits.<sup>38</sup>

11. contactMEO responds that the Bureau denied EchoStar's applications not because it was incomplete, but because EchoStar did not make the required technical showing that its proposed system would not interfere with NGSO FSS systems. contactMEO states that, in contrast, it demonstrated a method by which its proposed system can protect NGSO FSS systems. EchoStar filed a reply, reiterating its request to be treated similarly to contactMEO.<sup>39</sup>

### III. DISCUSSION

#### A. contactMEO's System Proposal

12. contactMEO proposes a satellite system consisting of two components, an NGSO component using three HEO satellites, and a GSO component using one satellite at four different orbital locations. Although contactMEO refers to its system as a "NGSO system," and requests us to treat it as such, we will not do so. The operations of GSO FSS satellites are inherently different from NGSO FSS satellite operations. For this reason, Part 25 of the Commission's rules governing satellite operations contains separate sets of technical requirements for NGSO FSS and GSO FSS satellites and the Ka-band plan contains separate designations for NGSO and GSO satellites. Consequently, we will consider the NGSO and GSO portions of contactMEO's applications separately.

#### B. Processing Framework

13. When contactMEO filed its initial application, it was included in a processing round -- a licensing procedure by which applications proposing operations in a particular frequency band were grouped and processed together. Under this process, if an application was deemed acceptable for filing, the Bureau released a public notice announcing a "cut off" date for other interested parties to file applications to be considered concurrently. In 2003, the Commission revised the space station licensing process and adopted a "first come, first served" procedure for GSO-like applications, and a modified processing round approach for NGSO applications, which enables the Commission to act on applications

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<sup>35</sup> *EchoStar Petition to Deny*, at 9.

<sup>36</sup> Consolidated Petition to Dismiss or Deny of SES Americom, Inc., Filed September 13, 2004. (*SES Americom Petition*). SES Americom's petition also addresses an application filed by Northrop Grumman Space & Mission Systems Corporation for authority to operate a system composed of HEO and GSO satellites in the V-band and Ka-band.

<sup>37</sup> *SES Americom Petition*, at 7.

<sup>38</sup> *SES Americom Petition*, at 10.

<sup>39</sup> EchoStar Satellite LLC, Consolidated Reply to Oppositions to Petitions to Deny, Filed October 8, 2004 (*EchoStar Reply*).



with greater efficiency.<sup>40</sup> However, the Commission decided not to apply the new processing rules to certain applications pending at that time, such as those in the Ka-band NGSO processing round. This is because the Commission was in the process of considering sharing rules for Ka-band NGSO licensees, and completing that rulemaking proceeding would lead to the best-suited licensing method for those Ka-band NGSO applications without delaying grant of the licenses.<sup>41</sup> Therefore, we continue to process the NGSO portion of contactMEO's applications as part of the second Ka-band NGSO FSS processing round.

14. contactMEO amended its application proposing to add GSO FSS satellites to its system in March 2004, after the Commission reformed its processing procedures. Under the Commission's rules, GSO FSS satellite applications are considered under a "first come, first served" procedure, in which we grant the application if it is not inconsistent with any other licensed satellite or previously filed application, and the applicant is qualified to hold a satellite license. Consequently, we will process contactMEO's GSO FSS applications under the first come, first served procedure.

### C. Qualifications

15. All applicants requesting authority to launch and operate a satellite space station must present information sufficient to establish their legal, technical, and financial qualifications to hold a Commission license. The regulations set forth in Part 25 of the Commission's rules govern FSS applicants and licensees.

#### 1. Legal and Financial

16. We find that nothing in the record raises concerns about contactMEO's legal qualifications to hold a Commission license. In its *First Space Station Licensing Reform Order*, the Commission eliminated the financial requirements then in place and replaced them with a bond requirement, discussed below.<sup>42</sup>

#### 2. Technical Qualifications

##### a. The Ka-Band Plan

##### i. Ka-band Uplink

17. The Commission completed its proceeding involving the 27.5-30.0 GHz frequency band in 1996. At that time, the Commission segmented the band and designated specified portions for terrestrial operations, feeder link operations for mobile-satellite service (MSS) systems, service link operations for GSO FSS systems, and service link operations for NGSO FSS systems.<sup>43</sup> Significantly, the Commission adopted discrete designations for NGSO FSS systems and GSO FSS systems, while adopting shared designations for other services. As relevant here, the Commission designated the 28.35-28.6 GHz and 29.5-30.0 GHz frequency bands to GSO FSS (Earth-to-space) on a primary basis, with NGSO FSS services (Earth-to-space) permitted on a secondary basis.<sup>44</sup> It also designated the 28.6-29.1

<sup>40</sup> Amendment of Commission's Space Station Licensing Rules and Policies, Mitigation of Orbital Debris, *First Report and Order and Further Notice of Proposed Rulemaking in IB Docket No. 02-34, and First Report and Order in IB Docket No. 02-54*, 18 FCC Rcd 10760 (2003) (*First Space Station Licensing Reform Order*).

<sup>41</sup> *First Space Station Licensing Reform Order*, 18 FCC Rcd at 10866-67.

<sup>42</sup> *First Space Station Licensing Reform Order*, 18 FCC Rcd at 10826. See also 47 C.F.R. § 25.165.

<sup>43</sup> *Ka-band Plan Order*, 11 FCC Rcd 19005 (1996).

<sup>44</sup> *Ka-band Third Report and Order*, 12 FCC Rcd at 22310.

GHz frequency band to NGSO FSS (Earth-to-space) on a primary basis.<sup>45</sup> In adopting the band plan, the Commission stated that “[t]he plan ... designates co-frequency sharing in band segments where the Commission and the parties have concluded it is technically feasible.”<sup>46</sup> The uplink plan is depicted as follows:

<u>Frequency Band (Total)</u>	28.35-28.6 GHz (250 megahertz)	28.6-29.1 GHz (500 megahertz)	29.25-29.5 GHz (250 megahertz)	29.5-30.0 GHz (500 megahertz)
<u>Non-Government Service</u>	GSO FSS NGSO FSS (secondary)	NGSO FSS GSO FSS (secondary)	GSO FSS	GSO FSS NGSO FSS (secondary)

## ii. Ka-band Downlink

18. Similarly, the Commission adopted rules for non-Federal users involving the space-to-Earth (downlink) FSS allocation at 18.3-20.2 GHz, which designated the 18.58-18.8 GHz frequency band for exclusive use by GSO FSS, and the 18.8-19.3 GHz downlink segment for primary NGSO FSS use.<sup>47</sup> The Commission originally permitted NGSO FSS systems to operate service downlinks in the 17.7-18.8 GHz and 19.7-20.2 GHz frequency bands on a secondary basis to GSO FSS systems. In the *18 GHz Order*, however, the Commission eliminated the secondary NGSO designation after concluding that “secondary use of the 18 GHz band is not viable because it would unreasonably inhibit ubiquitous deployment of these services and limit the use of spectrum by primary users of the bands.”<sup>48</sup> The Commission confirmed this conclusion on reconsideration, stating that removing secondary operations lessens the potential for harmful interference to the primary services and avoids disruptions that could occur to users of secondary services.<sup>49</sup> The downlink plan is depicted as follows:<sup>50</sup>

<u>Frequency Band (Total)</u>	18.3-18.58 GHz (280 megahertz)	18.58-18.8 GHz (220 megahertz)	18.8-19.3 GHz (500 megahertz)	19.7-20.2 GHz (500 megahertz)
<u>Non-Government Service</u>	GSO FSS	GSO FSS	NGSO FSS	GSO FSS

19. In addition Federal GSO and NGSO systems operate throughout the 17.8-20.2 GHz frequency band. These federal systems operate in accordance with the power flux-density (pfd) limits

<sup>45</sup> *Ka-Band Plan Order*, 11 FCC Rcd at 10930.

<sup>46</sup> *Ka-band Plan Order*, 11 FCC Rcd at 19024.

<sup>47</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 the Broadcast Satellite Service Use, *Report and Order*, 15 FCC Rcd 13430, 13432 (2000) (*18 GHz Order*).

<sup>48</sup> *18 GHz Order*, 15 FCC Rcd at 13457.

<sup>49</sup> Redefinition of the 17.7-19.7 GHz Frequency Band, Blanket Licensing of Satellite Earth Stations in the 17.7-20.2 GHz and the 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, *First Order on Reconsideration*, 16 FCC Rcd 19808, 19821 (2001).

<sup>50</sup> Federal GSO FSS and non-GSO FSS networks are authorized and operating on a primary basis in the band 17.8-21.2 GHz.



contained in the current International Telecommunication Union (ITU) Radio Regulations.<sup>51</sup> Non-Federal systems must be coordinated with these Federal systems in accordance with footnote US 334 to the Table of Allocations.<sup>52</sup> As set forth in the *NGSO Report and Order*, each NGSO FSS licensee must complete coordination with all other operational NGSO FSS licensees and with Federal FSS systems, prior to the launch of its first satellite.<sup>53</sup>

## b. NGSO Component

### i. Spectrum Issues

20. contactMEO proposes to use the NGSO-designated primary spectrum in the 18.8-19.3 GHz and 28.6-29.1 GHz frequency bands for its communications links between earth stations and its HEO satellites.<sup>54</sup> These operations are consistent with the Ka-band plan. Upon grant of contactMEO's launch and operating authority, contactMEO must coordinate with Federal systems in the 18.8-19.3 GHz band in accordance with footnote US 334 to the Table of Frequency Allocations.<sup>55</sup> contactMEO must also comply with the applicable pfd limits in section 25.208(e) of the Commission's rules, and International Telecommunication Union (ITU) Article 21.16 (Table 21-4).<sup>56</sup> contactMEO must complete coordination with all Federal FSS systems and other operational NGSO FSS licensees prior to launch of its first satellite. Although contactMEO states its system design will avoid in-line interference events, it must nonetheless comply with the spectrum sharing method adopted in the *NGSO Report and Order* when circumstances arise.<sup>57</sup>

21. In addition, contactMEO requests a waiver of the Ka-band plan to operate its HEO satellites on a non-interference basis in the 19.7-20.2 GHz and 29.5-30.0 GHz frequency bands, spectrum designated for primary GSO FSS use.<sup>58</sup> contactMEO asserts that its HEO satellites will meet the equivalent power flux-density (epfd) limits in Article 22 of the ITU Radio Regulations, and that its downlink epfd levels are at least 15 db lower than the values in Article 22. Consequently, contactMEO states that its system will not cause unacceptable interference to GSO FSS networks and that it will not claim protection from GSO FSS operations in these bands.<sup>59</sup>

<sup>51</sup> See *18 GHz Order*, 15 FCC Rcd at 13473. The power flux-density limits in the 18.3-18.6 GHz band are -115/-105 dB (W/m<sup>2</sup>) in any one megahertz band, depending on the angle of arrival. There are currently no power flux-density limits in the 19.7-20.2 GHz band. See Letter from William T. Hatch, National Telecommunications and Information Administration, to Dale Hatfield, Chief, Office of Engineering and Technology, FCC (March 29, 2000).

<sup>52</sup> 47 C.F.R. § 2.106, US 334.

<sup>53</sup> *NGSO Report and Order*, 18 FCC Rcd at 14722. See also 47 C.F.R. § 2.106, US 334. A licensee may initiate coordination under US 334 by submitting a letter request to the Commission. A system is deemed operational when at least one of its satellites reaches its intended orbit and initiates transmission and reception of radio signals.

<sup>54</sup> *contactMEO March Amendment*, at 6.

<sup>55</sup> 47 C.F.R. § 2.106, US 334.

<sup>56</sup> *Id.* See also 47 C.F.R. § 25.208(e), ITU Radio Regulations, Article 21.16 (Table 21-4), and *First Space Station Licensing Reform Order*, 18 FCC Rcd at 10784.

<sup>57</sup> *NGSO Report and Order*, 18 FCC Rcd at 14714; 47 C.F.R. § 25.261. As set forth in Part 25 of our rules, contactMEO must also request authority for Earth-to-space transmissions in an Earth station application. 47 C.F.R. § 25.115. In the *18 GHz Order*, the Commission authorized earth station blanket licensing for NGSO/FSS systems in the bands in which NGSO/FSS is designated primary status, specifically the 18.8-19.3 GHz and 28.6-29.1 GHz frequency bands. *18 GHz Order*, 15 FCC Rcd at 13432.

<sup>58</sup> *contactMEO March Amendment*, at 1.

<sup>59</sup> *contactMEO March Amendment*, at 17.

22. SES Americom disagrees that a waiver of the Commission's band plan is warranted based on contactMEO's compliance with Article 22's epfd limits. SES Americom states the Commission has not considered or adopted the ITU's international epfd limits and that contactMEO has not justified the use of these limits domestically.<sup>60</sup>

23. In the 29.5-30.0 GHz uplink band, NGSO FSS operators may operate on a secondary basis to GSO FSS systems. Because contactMEO proposes NGSO FSS operations on a secondary basis in this band, no waiver is required. As a secondary user, however, contactMEO's operations shall not cause harmful interference to primary GSO FSS operations, nor can it claim protection from harmful interference from GSO FSS operations. In considering requests to operate on a secondary basis, the Commission has always required applicants to demonstrate that their proposed secondary operations are not likely to cause interference to primary operations.<sup>61</sup> To do otherwise would create an unacceptable likelihood of disruption to primary services.

24. Based on our review of contactMEO's technical showing, it appears that contactMEO's NGSO FSS operations should not interfere with GSO FSS operations. contactMEO's technical demonstration used computer simulation software developed in accordance with specifications outlined in ITU-R Recommendation S.1503 and demonstrated that the maximum uplink epfd limits calculated for its HEO satellites satisfy Article 22 of the ITU Radio Regulations.<sup>62</sup> According to Article 22.5I of the ITU Radio Regulations, if the associated epfd limits are met, the ITU maintains the NGSO FSS satellite system has fulfilled its obligations under Article 22.2 with respect to any GSO FSS network and that any interference by the NGSO FSS system into the GSO FSS network is acceptable.<sup>63</sup> While we have not adopted the ITU limits domestically we conclude contactMEO's compliance with these limits provides a sufficient basis to grant contactMEO's request to use the 29.5-30.0 GHz frequency band on a secondary basis.

25. Non-Federal use of the 19.7-20.2 GHz downlink band is designated for GSO FSS services only, with no secondary designation for NGSO FSS. contactMEO therefore requested a waiver for its HEO satellites to use this portion of the band. Waivers may be granted for good cause shown.<sup>64</sup> A waiver is appropriate if (1) special circumstances warrant a deviation from the general rule, and (2) such deviation would better serve the public interest than would strict adherence to the rule.<sup>65</sup> Generally, the Commission may grant a waiver of its rules in a particular case if the relief requested would not undermine the policy objective of the rule in question, and would otherwise serve the public interest.<sup>66</sup> Further, in considering requests for non-conforming spectrum uses, the Commission has indicated it

<sup>60</sup> *SES Americom Petition*, at 6.

<sup>61</sup> Qualcomm, Inc., *Memorandum Opinion and Order, and Authorization*, 4 FCC Rcd 1543 (1989) (authorizing LMSS on a secondary basis in the 14GHz band and on a non-conforming basis in the 12 GHz band).

<sup>62</sup> *contactMEO March Amendment*, at 63, Attachment D. contactMEO's calculation assumed five NGSO users operating in the same frequency channel within GSO 1.55 degrees beam. The maximum uplink epfd levels are: 0.7m: -176.2 dB (W/m<sup>2</sup>/40 kHz); 1.2 m: -185.73 dB (W/m<sup>2</sup>/40 KHz). *Id.* Commission staff verified the information with the corresponding limits, defined in Article 22 of the International Telecommunication Union Radio Regulations.

<sup>63</sup> Article 22.2 states that non-geostationary satellite systems shall not cause unacceptable interference to geostationary-satellite systems in the fixed-satellite service and the broadcasting-satellite service operating in accordance with these Regulations. ITU Radio Regulation, Article 22, No. 22.2 (WRC-97).

<sup>64</sup> 47 C.F.R. § 1.3. See also *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969) (*WAIT Radio*); *Northeast Cellular Tel. Co. v. FCC*, 897 F.2d 1166 (D.C. Cir. 1990) (*Northeast Cellular*).

<sup>65</sup> See *Northeast Cellular*, 897 F.2d at 1166.

<sup>66</sup> See *WAIT Radio*, 418 F.2d at 1157.

would generally grant such waivers "when there is little potential for interference into any service authorized under the Table of Frequency Allocations and when the non-conforming operator accepts any interference from authorized services."<sup>67</sup>

26. contactMEO, relying on its computer simulation software, demonstrates that the operations of its HEO satellites in the 19.7-20.2 GHz band meet the efd limits in Article 22, Tables 22-1C and 22-4B. U.S. licensed satellites must satisfy the ITU limits if there is a possibility of interference with a non-U.S. licensed system. As noted above, the ITU considers a NGSO FSS system that meets these efd limits to have fulfilled its obligations under Article 22.2 with respect to any GSO FSS network, and any interference by the NGSO FSS system into the GSO FSS network is acceptable.<sup>68</sup> In light of the ITU rules and our verification of contactMEO's software calculations, we find that contactMEO's operations should not affect any of the primary non-Federal services in the band.<sup>69</sup> Therefore, we grant contactMEO's waiver request and authorize contactMEO to operate on a non-conforming, no interference basis in the 19.7-20.2 GHz frequency band. contactMEO will be required to comply with any service-band-specific service rules that the Commission may adopt in the frequency band.

27. contactMEO must also coordinate with Federal GSO and NGSO FSS systems in this frequency band in accordance with footnote US 334 to the Table of Frequency Allocations. contactMEO must complete coordination with Federal FSS systems prior to the launch of its first satellite. As a non-conforming user, contactMEO's operations will be on a non-harmful interference basis, and contactMEO will not be protected from interference from other non-Federal GSO FSS, and Federal GSO and NGSO FSS operations in this band. In addition, as a non-conforming user, contactMEO shall not cause harmful interference to any authorized Federal GSO or NGSO FSS system, and shall immediately cease operations upon notification of such harmful interference resulting from its operations. Coordination is required with specific earth stations in a geostationary-satellite network in the fixed-satellite service, either within the U.S. for domestic service or any points outside the U.S. for international service, under ITU Article 9, No. 9.7A. We note that the ITU has adopted recommendations for GSO FSS operators in identifying the source of interference in excess of the operational efd limits.<sup>70</sup> It has also adopted methodologies to measure efd levels to verify compliance with the operational efd limits.<sup>71</sup> We will also require contactMEO to provide ephemeris data for their NGSO satellites, when operational.<sup>72</sup> Consequently, we find that granting the waiver will not undermine the objective of the rule to protect primary services and will serve the public interest by allowing contactMEO to offer consumers a range of broadband and interactive services.

## ii. Inter-Satellite Links

28. contactMEO also proposes to use inter-satellite links (ISLs) for its NGSO satellites in

<sup>67</sup> Fugro-Chance, Inc., *Order and Authorization*, 10 FCC Rcd 2860 (Int'l Bur. 1995) (authorizing non-conforming MSS in the C-Band); Motorola Satellite Communications, Inc., *Order and Authorization*, 11 FCC Rcd 13952, 13956 (Int'l Bur. 1996).

<sup>68</sup> The exception is GSO FSS networks with sensitive receiving earth stations with very large antennas, which are coordinated with non-GSO FSS systems under ITU Article 9, 9.7A.

<sup>69</sup> Although the Commission eliminated secondary designations in this band to "lesse[n] the potential for harmful interference to primary services," contactMEO's proposed operations do not raise the concerns at issue when the Commission eliminated the secondary designations. See paragraph 18, above.

<sup>70</sup> Recommendation ITU-R S.1527, Article 22 Table 22-4B.

<sup>71</sup> Recommendation ITU-R S.1558.

<sup>72</sup> *NGSO Report and Order*, 18 FCC Rcd at 14720.



either the 59-64 GHz or 54.25-58.2 GHz frequencies.<sup>73</sup> The 59-64 GHz band is not available for non-Federal ISL use. Furthermore, the 54.25-58.2 GHz frequencies are limited to GSO ISL use only. Consequently, we deny this portion of contactMEO's application, without prejudice to contactMEO reapplying to use ISLs in a band appropriate for NGSO FSS satellites. In the alternative, contactMEO suggests the use of optical ISLs, although it does not propose any specific frequencies. Under these circumstances, no further action is necessary at this time.<sup>74</sup>

### iii. Coverage Requirement

29. In the *Ka-band Third Report and Order*, the Commission adopted NGSO coverage requirements. Specifically, the rules state that Ka-band NGSO FSS systems must be capable of serving locations as far north as 70 degrees latitude and as far south as 55 degrees latitude for at least 75 percent of every 24-hour period.<sup>75</sup> These systems must also be capable of providing FSS on a continuous basis throughout the 50 states, Puerto Rico and the U.S. Virgin Islands.<sup>76</sup> We find that contactMEO's proposal meets this coverage requirement.<sup>77</sup>

### iv. Replacement Satellites

30. In the *NGSO Report and Order*, the Commission adopted a blanket licensing system that covers all construction and launches necessary to implement the constellation and maintain it until the end of the license term, including replacement satellites needed due to launch or operational failure, or the retirement of satellites prior to the end of the license period.<sup>78</sup> As a result, contactMEO's authorization covers all construction of its NGSO FSS satellites necessary to implement the constellation and to maintain it until the end of the license period. As set forth in the *NGSO Report and Order*, any replacement satellites that contactMEO launches before the end of the constellation's license term must be technically identical to those in service, including the same frequency bands and orbital parameters, and may not result in a net increase in the number of satellites in the authorized orbital plane or add an orbital plane.<sup>79</sup>

#### c. GSO Component

##### i. Spectrum Issues

31. contactMEO proposes to operate its four GSO satellites at the 83° W.L., 121° W.L., 34° E.L., and 130° E.L. orbit locations, using the 28.6-29.1 GHz (uplink) and 18.8-19.3 GHz (downlink) bands on a non-harmful interference basis to primary NGSO FSS operations. No other applications have

<sup>73</sup> *contactMEO Application*, at 36.

<sup>74</sup> The Commission's Table of Frequency Allocations addresses frequencies between 9 KHz and 400 GHz. 47 C.F.R. § 2.102. Optical frequencies are above 400 GHz. The ITU Radio Regulations do not include any allocations above 275 GHz. However, footnote 5.565 of the Radio Regulations Table of Frequency Allocations lists a number of potential uses of these frequencies and urges consideration of the uses until such time a table of allocations is developed in those bands.

<sup>75</sup> *Ka Band Third Report and Order*, 12 FCC Rcd at 22323. See also 47 C.F.R. § 25.145(c)(1).

<sup>76</sup> 47 C.F.R. § 25.145(c)(2).

<sup>77</sup> *contactMEO Application*, at 19.

<sup>78</sup> *NGSO Report and Order*, 18 FCC Rcd at 14726.

<sup>79</sup> 47 C.F.R §§ 25.145(h) and (i).

been filed for authority to operate Ka-band GSO satellites at these orbit locations. contactMEO again requests waivers of the band plan to allow this proposed use.<sup>80</sup> contactMEO states its GSO FSS satellites will comply with applicable pfd limits in section 25.208(e) of the Commission's rules and ITU Article 21.16 (Table 21-4).<sup>81</sup> contactMEO also states that the GSO satellites will reduce the need for other NGSO FSS satellite systems to reduce spectrum when in-line with a contactMEO NGSO FSS satellite because contactMEO would switch operations to a GSO FSS satellite during in-line events.<sup>82</sup> contactMEO states that a waiver under these circumstances will advance the public interest, and will not undermine the purpose of the rule establishing 18.8-19.3 GHz and 28.6-29.1 GHz band for NGSO FSS use.

32. SES Americom and EchoStar assert that we should deny this request in light of the Satellite Division's denial of EchoStar's applications to use GSO satellites in NGSO FSS primary spectrum.<sup>83</sup> SES Americom states that contactMEO has failed to justify a different outcome. SES Americom notes that the mechanism proposed by contactMEO to protect NGSO FSS systems is no different from EchoStar's proposal.<sup>84</sup>

33. The 28.6-29.1 GHz frequency band contains a secondary designation for GSO FSS systems. Consequently, we need not address contactMEO's request for a waiver to operate in this uplink spectrum on a secondary basis. We will permit the contactMEO GSO FSS satellites to operate in this band if these operations will not interfere with primary FSS operations. Technical studies to develop interference criteria have not been completed. We recognize that without established NGSO FSS interference protection criteria, satellite operators cannot fully assess the impact of proposed GSO FSS operations on NGSO FSS operations.<sup>85</sup> Nevertheless, contactMEO has provided a quantitative demonstration of how its GSO FSS satellites will protect non-Federal NGSO FSS systems in both the 28.6-29.1 GHz and 18.8-19.3 GHz frequency bands. contactMEO's analysis included potential interference from its GSO FSS satellites into the HEO satellite design proposed by Northrop Grumman Space & Mission Systems Corporation (NGST). It also included an analysis of the low-Earth orbit satellite system proposed by SkyBridge II, which was subsequently withdrawn.<sup>86</sup> contactMEO analyzed the potential interference between each of these systems in terms of the Interference-to-Noise Ratio,  $I_0/N_0$  assuming a minimum topocentric line of sight angular separation of ten degrees. Based on the worse case scenarios, contactMEO calculated a  $I_0/N_0$  of -30.2 dB with respect to the NGST system, and an  $I_0/N_0$  of -15 dB with respect to the SkyBridge II system. This corresponds to a  $\Delta T/T$  of 0.10% and 3.16%, respectively. These values are well below the 6% threshold that triggers coordination between satellite systems where the ITU Radio Regulations require coordination. Thus, we conclude that the contactMEO satellite system will not cause harmful interference to the NGST system nor would it have to the SkyBridge II system. Furthermore, neither SES Americom nor EchoStar has provided any technical analyses to disprove contactMEO's demonstration. Thus, we have no reason to believe that contactMEO's study is invalid. We also have contactMEO's commitment that transmissions from their GSO FSS satellites operating in the NGSO FSS primary frequency bands will cease when there is a

<sup>80</sup> *contactMEO March Amendment*, at 17.

<sup>81</sup> *Id.* See also *First Space Station Licensing Reform Order*, 18 FCC Rcd at 10784.

<sup>82</sup> *Id.*

<sup>83</sup> *SES Americom Petition*, at 8.

<sup>84</sup> *SES Americom Petition*, at 9.

<sup>85</sup> See *Astrolink International, LLC, Order and Authorization*, 16 FCC Rcd 20124, 20127 (Int'l Bur. 2001).

<sup>86</sup> *contactMEO July Amendment*, at Annex 3. SkyBridge II LLC withdrew its Ka-band NGSO FSS application on October 21, 2004. *Public Notice, Policy Branch Information, Report No. SAT-00252*, 19 FCC Rcd 20950 (Int'l Bur. 2004).

potential for interference to a NGSO FSS system operating in these frequencies.<sup>87</sup> Based on this information, we will permit contactMEO to operate in the 28.6-29.1 GHz band on a secondary basis. We condition this authority, however, on contactMEO complying with any interference criteria that may be adopted by the Commission.

34. With respect to contactMEO's proposed downlink GSO FSS operations, section 2.106 of the Commission's rules prohibits GSO FSS use of the 18.8-19.3 GHz band.<sup>88</sup> In considering whether it should designate GSO FSS services as a secondary service in this primary NGSO FSS band, the Commission stated that a secondary designation would only be feasible if GSO FSS stations could operate without impacting NGSO FSS operations. The Commission concluded this is possible if the NGSO receiver avoided pointing at the geostationary orbit, but noted that the NGSO designation for the 18.8-19.3 GHz band does not restrict NGSO systems from pointing at the geostationary orbit.<sup>89</sup> The Commission further noted that this pointing flexibility increases the capacity of NGSO FSS satellites, since fewer NGSO FSS satellites are required if a larger part of the sky is available for service.<sup>90</sup> The Commission stated it would not constrain NGSO pointing flexibility to facilitate sharing with non-conforming GSO operations. Thus, the Commission did not designate a secondary GSO FSS service in the 18.8-19.3 GHz band.<sup>91</sup> In this instance, however, contactMEO's HEO orbital characteristics are such that the HEO receive earth stations will never point toward the geostationary arc. Furthermore, contactMEO's technical analysis, discussed above, demonstrates that its GSO downlinks would not cause harmful interference to either of the two non-Federal NGSO FSS systems then on file.<sup>92</sup> Therefore, we grant contactMEO a waiver of section 2.106 to provide GSO FSS service in the 18.8-19.3 GHz band. We require contactMEO to accept interference from all primary operations, including Federal GSO and NGSO systems, and secondary operations in this band, and to terminate operations if it causes harmful interference to any of these services.<sup>93</sup> contactMEO must also coordinate with Federal GSO and NGSO FSS systems in the 18.8-19.3 GHz band in accordance with footnote US 334 to the Table of Frequency Allocations.

35. Contrary to EchoStar's assertions, its applications are not similarly situated with contactMEO's. While both entities requested a waiver of the Ka-band plan to operate GSO satellites in NGSO-designated spectrum, EchoStar -- in contrast to contactMEO -- did not provide a technical analysis to support its waiver request. Generally, the Commission requires applicants proposing non-conforming operations to demonstrate that their proposed operations will not cause interference to into allocated services. Instead, EchoStar asserted that it did not need to provide a technical analysis because it would terminate operations upon notification that its GSO operations were posing a "concrete risk of harmful interference" to NGSO operations.<sup>94</sup> It also asserted that a waiver was justified because the NGSO-

<sup>87</sup> *contactMEO July Amendment*, at 8.

<sup>88</sup> 47 C.F.R. § 2.106, NG 165.

<sup>89</sup> Commission's statement included the 28.6-29.1 GHz band. The band plan, however, authorizes GSO FSS operations on a secondary basis in this band. *Ka-band Third Report and Order*, 12 FCC Rcd at 22327. Secondary operations in this uplink band are permitted because generally, the chances for interference from GSO FSS to NGSO FSS services are less likely than in the downlink band given the differing altitudes and orbit periods of these systems. Geostationary satellites orbit 22,300 miles above the Earth in the plane of the Earth's equator. Non-geostationary satellites typically operate at lower altitudes, and the orbit period is less than 24 hours.

<sup>90</sup> *18 GHz Order*, 15 FCC Rcd at 13459.

<sup>91</sup> *Id.*

<sup>92</sup> See paragraph 33, above.

<sup>93</sup> See, e.g., *The Boeing Company, Order and Authorization*, 16 FCC Rcd 22645 (Int'l Bur., OET 2001).

<sup>94</sup> See e.g., *EchoStar Satellite Corporation, Application for Authority to Construct, Launch, and Operate a Geostationary Satellite Using Ka-band Frequencies at 121° W.L.*, File No. SAT-LOA-20030827-00180, at 15 (continued...)



designated band, which was not being used, would otherwise remain fallow.<sup>95</sup> The Division rejected these assertions, citing several pending applications proposing NGSO operations in this band (including contactMEO's) and noting that EchoStar had not justified a departure from the Commission's policy to ensure that allocated services do not receive *any* interference from non-conforming services.<sup>96</sup> In contrast, contactMEO's application included an undisputed technical showing of non-interference. While contactMEO submitted this showing in an amendment to its initial application, this information was in the record when the Division reviewed the *merits* of contactMEO's proposal.<sup>97</sup>

## ii. Two-Degree Spacing

36. The Commission's two-degree spacing policy, established in 1983, was designed to maximize the number of satellites in orbit by ensuring that satellites in geostationary-satellite orbit can operate without causing harmful interference to other GSO FSS satellites located as close as two-degrees away in longitude on the GSO plane.<sup>98</sup> In the *Ka-Band Third Report and Order*, the Commission extended its two-degree spacing policy to GSO FSS space stations in the Ka-band.<sup>99</sup>

37. contactMEO indicates that its system design is consistent with operations in a two-degree spacing environment.<sup>100</sup> We will apply the two-degree-spacing requirement currently applied to GSO-like satellites in the C-band, Ku-band, and Ka-band satellites to GSO-like proposed satellites in the 18.8-19.3 GHz and 28.6-29.1 GHz frequency bands.<sup>101</sup> Applying this requirement assures that satellites in these bands will be designed to allow other satellites to operate in this band as close as two-degrees away. This decision does not preclude us from considering other service rules, or implementing a rulemaking proceeding. Rather, when we issue licenses in new frequency bands that comply with our two-degree-spacing requirements, we will do so subject to any band-specific service rules, or rules for earth station coordination in shared bands, that we may adopt in the future. Because there are no authorized co-frequency GSO FSS satellites within two-degrees of contactMEO's proposed orbital locations, contactMEO conducted a two-degree compatibility analysis using the technical characteristics of its own

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(*EchoStar Application*), denied in *EchoStar Satellite LLC, Memorandum Opinion and Order*, 19 FCC Rcd 7846 (Sat. Div., Int'l Bur. 2004) (*EchoStar Order*).

<sup>95</sup> *EchoStar Application*, at 16.

<sup>96</sup> *EchoStar Order*, 19 FCC Rcd at 7853.

<sup>97</sup> The Bureau had previously dismissed the contactMEO application as incomplete on grounds unrelated to the waiver request. Subsequently, the Division found that contactMEO's and several other applicants' failures to submit a two-degree analysis were based on a reasonable but incorrect interpretation of the Commission's rules. The Division therefore issued a Public Notice clarifying the rules and provided pending applicants with an opportunity to amend their applications to supply the needed information. It also reinstated three applications it dismissed on this ground, including contactMEO's. See also *Mobile Satellite Ventures Subsidiary LLC, Order*, 19 FCC Rcd 18133 (Sat. Div., Int'l Bur. 2004), and Letter to Peter Hadinger, Northrop Grumman Space & Mission Systems Corporation, from Thomas S. Tycz, Chief, Satellite Division, FCC (dated June 16, 2004). At that time, contactMEO submitted the revised technical showing.

<sup>98</sup> *Licensing of Space Stations in the Domestic Fixed-Satellite Service*, 54 Rad. Reg. 2d (P&F) 577, 589 (1983) ("*Two-Degree Spacing Order*").

<sup>99</sup> 47 C.F.R. § 25.140(b)(2).

<sup>100</sup> *contactMEO July Amendment*, Annex 1.

<sup>101</sup> 47 C.F.R. § 25.217. We note, however, that the power flux density (PFD) limits applicable to the C-band, Ku-band, and Ka-band are not included in our default service rules for GSO-like satellites. Instead, licensees will be required to comply with the applicable PFD limits established in the ITU Radio Regulations for the frequency band in which they plan to operate.

satellites.<sup>102</sup> Further, contactMEO provided a review of the potential degradation due to frequency sharing between a contactMEO satellite at 83° W.L. and a hypothetical satellite at 85° W.L. This representative analysis shows that contactMEO's GSO FSS satellites are compatible with a two-degree orbital spacing environment. Our review of contactMEO's application and technical analyses finds nothing to the contrary.<sup>103</sup> contactMEO must meet all Part 25 rules governing system operations, including section 25.202 and section 25.210.<sup>104</sup> Further, contactMEO must meet the current Ka-band power flux-density limits ("pfd") of sections 25.208(e) of the Commission's rules and ITU Article 21.16 (Table 21-4).<sup>105</sup>

### iii. Orbital Location Assignments

38. We grant contactMEO's request to operate its four GSO FSS satellites, one each at the 83° W.L., 121° W.L., 34° E.L. and 130° E.L. orbital locations. This request is consistent with our rule limiting the number of pending applications to five GSO-like space stations, and one NGSO-like system in the same frequency band.<sup>106</sup> Further, the requested orbital locations are available for assignment. EchoStar opposed contactMEO's application, in part, because EchoStar had previously applied to operate satellites at two of the orbital locations contactMEO requests and in the same frequency bands. As noted, the Division denied these applications. In seeking to have its applications reinstated, EchoStar asserts that its applications are similarly situated with contactMEO's application and thus the applications are mutually exclusive with respect to the NGSO Ka-band frequencies at the 83° W.L. and 121° W.L. orbital locations.

39. As noted, the Division denied EchoStar's applications to operate four GSO FSS satellites using NGSO spectrum in the Ka-band because EchoStar failed to submit a technical showing demonstrating that its proposed satellites would not cause interference to NGSO FSS systems in those frequency bands, or that a waiver of our rules was justified.<sup>107</sup> Thus, contrary to EchoStar's assertions, its applications are not similarly situated nor would they be mutually exclusive with contactMEO's application.

### d. Tracking, Telemetry and Command Function

40. contactMEO represents that its Tracking, Telemetry and Command (TT&C) functions for both its NGSO and GSO satellites will be provided in the NGSO Ka-band during normal operation with high gain antennas. For transfer orbit and emergency operations, contactMEO requests a waiver of section 25.202(g) of the rules to allow TT&C operations for these functions in the C-band.<sup>108</sup> Specifically, contactMEO proposes to use 2 megahertz of spectrum for uplink TT&C operations in the 6425-6525 MHz band, and 2 megahertz of spectrum for downlink operations in the 3650-3700 MHz

<sup>102</sup> By doing so, contactMEO indirectly conducted a two-degree compatibility analysis with respect to a GSO FSS satellite proposed by NGST, for the 119° W.L. location, and which has similar characteristics.

<sup>103</sup> *contactMEO July Amendment*, Annex 1.

<sup>104</sup> 47 C.F.R. § 25.202 (frequencies, frequency tolerances, and emission limitations) and section 25.210 (technical requirements for space stations in the Fixed-Satellite Service).

<sup>105</sup> 47 C.F.R. § 25.208(e) and Article 21.16 (Table 21-4) of the ITU Radio Regulations. *See also First Space Station Licensing Reform Order*, 18 FCC Rcd at 10784.

<sup>106</sup> 47 C.F.R. § 25.159.

<sup>107</sup> *EchoStar Order*, 19 FCC Rcd at 7851, 7853. EchoStar filed a Petition for Reconsideration of the Division's decision denying its applications. EchoStar Satellite LLC, Petition for Reconsideration, filed June 1, 2004. This request remains pending.

<sup>108</sup> *contactMEO March Amendment*, at 16.

band.<sup>109</sup> contactMEO asserts that a waiver is appropriate because the beam widths available in the C-band are much wider and thus increase the likelihood of success for operations during the injection phase of each satellite's life and in the event of an emergency.<sup>110</sup> contactMEO states these operations would be limited in duration and subject to coordination with other extended C-band operators where possible.<sup>111</sup>

41. Section 25.202(g) of the Commission's rules requires FSS systems to operate their TT&C links in the same frequency bands in which they are providing service.<sup>112</sup> The rule further provides that frequencies, polarization, and coding shall be selected to minimize interference into other satellite networks and within their own satellite system. contactMEO's request to operate TT&C frequencies in the C-band is inconsistent with section 25.202(g) of the Commission's rules. The purpose of the rule is to simplify the coordination process among satellites at adjacent orbit location by limiting the number of potentially affected operators to only those operators performing TT&C functions in the service bands. It also allows operators to maximize the efficiency of a system's TT&C operations.<sup>113</sup> contactMEO's waiver request fails to address the underlying purpose of the rule or demonstrate that a waiver is in the public interest. contactMEO's proposed use of C-band frequencies for emergency mode operations would not be limited in duration, as contactMEO asserts. To be effective for emergency use requires the frequencies to be set aside for use at any time for the life of the spacecraft, effectively precluding or conflicting with the use of the spectrum by other operators on a long term basis. Thus, we deny contactMEO's request for a waiver of section 25.202(g). Accordingly, contactMEO must, within 30 days of this Order, file a modification application specifying the exact Ka-band frequencies for these TT&C operations in accordance with section 25.202(g).

#### e. Orbital Debris Mitigation

42. Section 25.114(d) of the Commission's rules requires applicants for space station authorizations to 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>114</sup> This information addresses four specific elements of orbital debris mitigation: 1) spacecraft hardware and design; 2) minimizing accidental explosions; 3) safe flight profiles; and 4) post-mission disposal. contactMEO submitted an amendment addressing each of these elements for its GSO and NGSO satellites.<sup>115</sup>

43. In its orbital debris mitigation plan, contactMEO represents that it will incorporate vehicle design and operational techniques to minimize orbital debris.<sup>116</sup> It states that its system design

<sup>109</sup> *contactMEO March Amendment*, Technical Appendix, at 7.

<sup>110</sup> *contactMEO March Amendment*, at 16.

<sup>111</sup> *contactMEO March Amendment*, at 16.

<sup>112</sup> 47 C.F.R. § 25.202(g) (telemetry, tracking and telecommand functions for U.S. domestic satellites shall be conducted at either or both edges of the allocated band(s)).

<sup>113</sup> Amendment of the Commission's rules with Regard to the 3650-3700 MHz Government Transfer Band, First Report and Order and Second Notice of Proposed Rulemaking, 15 FCC Rcd 20488, 20538 (2000) (the rule effectively "limits FSS operators to operating TT&C links in the same frequency bands as their FSS operations").

<sup>114</sup> 47 C.F.R. § 25.114(d). contactMEO included an orbital debris mitigation plan in its amended application filed March 2004. It also submitted additional information in response to a *Public Notice* clarifying information that must be included in an applicant's casualty risk assessment if the planned post-mission disposal involves atmospheric reentry of the spacecraft. See *Orbital Debris Public Notice*, 19 FCC Rcd 10714; *contactMEO July Amendment*. contactMEO also submitted a further amendment in response to the *October Orbital Debris Public Notice*.

<sup>115</sup> *contactMEO November Amendment*.

<sup>116</sup> *contactMEO July Amendment*, Annex 2; *contactMEO November Amendment*, at 2.



will minimize the possibility of collision between satellites and other known objects. Further, contactMEO claims that it will coordinate with NASA, U.S. Space Command, and other U.S. Government agencies to minimize the risk of collision with government spacecraft.<sup>117</sup> In addition, contactMEO states that critical components of its system will be designed to minimize vulnerability to high-speed particles and untracked debris that may result in loss of satellite control.<sup>118</sup>

44. As a general matter, although the risk of collision between the satellites is extremely low, the Commission has indicated that in cases in which orbital parameters for proposed satellite systems are similar to those of other operating systems, such that the two systems may have an increased risk of physical collision, further review may be warranted.<sup>119</sup> In April 2005, the Division asked contactMEO and NGST to provide written explanations regarding measures they will take to avoid in-orbit collisions between the NGSO satellites in their constellations which have similar orbital parameters.<sup>120</sup> In response, contactMEO and NGST stated that operational conditions, i.e., initial orbital parameters, and ongoing coordination will ensure that the two systems' operations are physically compatible.<sup>121</sup>

45. Concerning safe flight profiles for its GSO satellites, contactMEO states it has assessed and limited the probability of spacecraft becoming a source of debris by collisions with large debris or other operational space stations.<sup>122</sup> contactMEO asserts that its GSO satellites will be located at 121° W.L., 83° W.L., 34° E.L., and 130° E.L., and that it has analyzed other GSO satellites that could be within the station keeping volume of its satellites. With respect to the 121° and 83° W.L. orbit locations, at which contactMEO identified other satellites that may have overlapping station keeping volumes, contactMEO indicates it will accommodate co-location by "flying at non-zero inclination and eccentricity."<sup>123</sup> contactMEO also indicates that "sufficient fuel will be loaded on the [contactMEO] satellite to maintain the differing inclination to within 0.1 degrees."<sup>124</sup>

46. At end of mission of its HEO satellites, contactMEO plans to de-orbit its HEO satellites through controlled re-entry by using a series of maneuver burns. contactMEO states that the deorbit process will be designed to assure that the satellite is stable and under control throughout the process.<sup>125</sup> contactMEO has identified an open area in the southern Pacific Ocean as the projected geographic region of the debris field.<sup>126</sup> contactMEO also states that authorities for shipping lanes and airline routes in the area of the debris field will be notified of the event. contactMEO represents that it will prepare additional debris assessment reports during program development.<sup>127</sup>

<sup>117</sup> *contactMEO October Amendment*, at 2.

<sup>118</sup> *contactMEO November Amendment*, at 2.

<sup>119</sup> See e.g., *Orbital Debris Order*, 19 FCC Rcd at 11588.

<sup>120</sup> Letter to David Drucker, Manager, contactMEO Communications, LLC from Robert Nelson, Chief, Satellite Engineering Branch (April 27, 2005). See also Letter to Peter Hadinger, Northrop Grumman Space & Missions Systems Corp., from Robert Nelson, Chief, Satellite Engineering Branch (April 27, 2005).

<sup>121</sup> Letter to Marlene Dortch, Secretary FCC, from James M. Talens, Attorney for contactMEO Communications, LLC (May 12, 2005); Letter to Marlene Dortch, Secretary FCC, from Stephen D. Baruch, Attorney for Northrop Grumman Space & Mission Systems Corporation (May 12, 2005).

<sup>122</sup> *contactMEO November Amendment*, at 3.

<sup>123</sup> *contactMEO November Amendment*, at 4.

<sup>124</sup> *contactMEO November Amendment*, at 4.

<sup>125</sup> *contactMEO July Amendment*, Annex 2; *contactMEO November Amendment*, at 12.

<sup>126</sup> *contactMEO July Amendment*, Annex 2.

<sup>127</sup> *contactMEO November Amendment*, at 12.

47. This case is the first in which we have addressed a system's plans to dispose of satellites using controlled atmospheric reentry at end-of-life. According to contactMEO, its system is still in the design process. Given the stage of development for its HEO NGSO constellation, contactMEO's application does not provide more detailed information concerning end-of-life operations, such as detailed operational plans, methods for coordination with relevant government agencies, and insurance arrangements. We believe that a more detailed review of these issues is warranted as system design progresses, and prior to authorization of launch and operating authority. Until such a review can be completed, we are not in a position to conclude that either the disposal of contactMEO's satellites, or the launch that would necessitate disposal, are in the public interest. Accordingly, we will require contactMEO to file, no later than 30 days following completion of the Critical Design Review milestone for its NGSO satellites, an application to modify its license, specifying its end-of-life operations. This application should provide detailed information concerning all aspects of the proposed disposal plan. Because the United States is potentially strictly liable for any damage caused on the surface of the Earth by re-entering contactMEO satellites, we would anticipate that such a plan would involve insurance policies listing the United States as an additional insured party. Authority to launch and operate the satellites, as specified in this Order, will be granted if the information submitted demonstrates that contactMEO's end-of-life disposal plans are in the public interest.

#### D. License Conditions

##### 1. Milestone Schedule

48. To ensure that licensees remain able and committed to implementing their planned satellites and do not hold scarce orbit/spectrum resources to the exclusion of other entrants, the Commission imposes milestone schedules on each licensed satellite. If a licensee fails to meet any of these milestones, the license becomes null and void. These milestones are set forth in section 25.164 of the Commission's rules, and are slightly different for GSO satellites and NGSO satellite constellations.<sup>128</sup>

49. Licensees of satellite systems that include both GSO and NGSO components are required to construct the GSO portions of their system within the GSO milestones and the NGSO portion of their system within the NGSO milestones.<sup>129</sup> Licensees of NGSO systems must meet five milestones: (1) enter into a binding non-contingent contract to construct the satellite system within one year of licensing; (2) complete critical design review of the licensed system within two years of licensing; (3) begin construction of the first satellite in the licensed system within two years, six months of licensing; (4) launch and operate the first satellite within three years, six months; (5) bring all of the satellites licensed in the system into operation within six years of licensing.<sup>130</sup> Licensees of GSO satellites must meet four milestones: 1) enter into a binding non-contingent contract to construct the licensed satellite(s) within one year of licensing; 2) complete critical design review within two years of licensing; 3) begin construction of the satellite(s) within three years; and 4) launch and operate the satellite(s) within five years of licensing.<sup>131</sup> In addition, licensees must submit certifications of milestone compliance within 10 days following each milestone specified herein. These milestones are incorporated as a condition of contactMEO's license. Failure to comply with a milestone, file a certification of compliance, or filing a certification of non-compliance will result in automatic cancellation of contactMEO's authorization with

<sup>128</sup> 47 C.F.R. § 25.164(a) and (b).

<sup>129</sup> Amendment of the Commission's Space Station Licensing Rules and Policies, *First Order on Reconsideration and Fifth Report and Order*, 19 FCC Rcd 12637, 12655 (2004) (*Space Station Licensing Reform Order, First Order on Reconsideration*).

<sup>130</sup> 47 C.F.R. § 25.164(b).

<sup>131</sup> 47 C.F.R. § 25.164(a).

no further action required on the Commission's part.

## 2. License Term

50. The license term for both GSO and NGSO satellites is 15 years. For GSO satellites, the term begins on the date the licensee certifies to the Commission that the satellite has been placed in orbit and its operations conform to the conditions in its authorizations. For NGSO satellite systems, the term commences when the licensee certifies to the Commission that its initial satellite has been placed in orbit and is operating in compliance with its authorization.<sup>132</sup> Consequently, the time at which the license term begins to run will likely vary for contactMEO's NGSO and GSO components.

## 3. Reporting Requirements

51. contactMEO must follow the Part 25 rules for reporting requirements for FSS systems, including an annual report describing the status of satellite construction and anticipated launch date, and a detailed description of the use made of each transponder on its in-orbit satellites.<sup>133</sup> contactMEO must file this report on June 30 of each year, containing information current as of May 31 of that year.

## 4. International Coordination

52. In general, we will follow the applicable advance publication, coordination, due diligence and notification procedures as set forth in the ITU Radio Regulations in coordinating contactMEO's satellites with other affected administrations. No protection from interference caused by radio stations authorized by other administrations is guaranteed unless coordination procedures are timely completed or, with respect to individual administrations, by successfully completing coordination agreements. In order to do so, we require that contactMEO provide the Commission with the international coordination information specified in our rules.<sup>134</sup> contactMEO will be responsible for all cost recovery fees associated with any ITU filings on behalf of its system.

## 5. Bond

53. In the *First Space Station Licensing Reform Order*, the Commission eliminated the financial requirements then in place and replaced them with a bond requirement.<sup>135</sup> The bond requirement is intended to deter speculative space applications and ensure that satellites are timely launched and service is provided to customers. Under this new requirement, entities awarded a license for a NGSO-like satellite must execute a \$5 million performance bond, and entities awarded a GSO-like license must execute a \$3 million performance bond, payable to the U.S. Treasury, within 30 days of the date the license is granted.<sup>136</sup> Licensees of satellite systems with both GSO and NGSO satellites, where both components are operating in the same frequency band, are required to post a \$5 million bond.<sup>137</sup> The bond is payable upon failure to meet any implementation milestone in the license, unless an adequate

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<sup>132</sup> 47 C.F.R. § 25.121.

<sup>133</sup> 47 C.F.R. § 25.210(l).

<sup>134</sup> 47 C.F.R. § 25.111(b).

<sup>135</sup> *Space Station License Reform Order*, 18 FCC Rcd at 10824. See also 47 C.F.R. § 25.165.

<sup>136</sup> In the *Space Station Licensing Reform Order*, the initial bond requirement for NGSO-like satellites was \$7.5 million, and \$5 million for GSO-like satellites. On reconsideration, the Commission reduced these amounts to \$5 million and \$3 million respectively. *Space Station Licensing Reform Order, First Order on Reconsideration*, 19 FCC Rcd at 12654. See also 47 C.F.R. § 25.165(a).

<sup>137</sup> 47 C.F.R. § 25.165(a)(3).



justification for extending the license is provided.<sup>138</sup> In its *First Space Station Licensing Reform Order*, the Commission stated that it would entertain requests for complete or partial waivers of this bond requirement, but limited its discussion to waivers "for satellite operators proposing satellites designed to provide public safety services." The Commission noted that it would consider things "such as public safety intent in deciding whether a waiver is warranted."<sup>139</sup>

54. contactMEO seeks a complete waiver of this requirement, but asks for a partial waiver in the alternative.<sup>140</sup> contactMEO asserts that a waiver is warranted because it currently provides satellite public safety services, by way of leased capacity, and proposes to continue these services as a core element of its Ka-band satellite business plan. contactMEO states that it provides broadcast, streaming and data services using fiber, microwave and satellite technologies from its earth station in Colorado, including IP services to rural locations such as Alaska, as well as IP connectivity and multimedia streaming to Antarctica.<sup>141</sup> It further represents that the focus of its services is on public safety. As an example, contactMEO states that the National Science Foundation uses its services for IP connectivity which has been used in emergency situations.<sup>142</sup> contactMEO's satellite services are also used by TelAlaska, a telephone service provider to remote Alaskan communities, for IP connectivity. Other services in Alaska include: a 1) lifeline internet service; 2) communication services for a library network; 3) telephone and data services; and 4) internet backbone services.<sup>143</sup> With its Ka-band authorization, contactMEO states it will offer bandwidth services in remote areas of North America and elsewhere, at a reduced price, with target customers including hospitals, universities, governments, schools, and charitable organizations. Thus, contactMEO claims that its services will support public safety and emergency services locally and regionally. In granting a waiver, contactMEO states, the Commission will eliminate an unnecessary financial barrier to implementing important public safety services in the United States.

55. Although contactMEO proposes to provide public safety services with its proposed satellite service, it states that its primary goal is to offer broadband services to unserved and underserved areas of the world for telemedicine, education, and economic development.<sup>144</sup> While these are laudable goals, these services are not principally or solely for public safety services.<sup>145</sup> Consequently, we find that contactMEO has failed to demonstrate good cause for a full or partial waiver.

56. In addition, we reject contactMEO's claim that the bond should be waived because the Commission's concern about speculation in satellite applications is not present in this case due to the fact that contactMEO continues to pursue its application even though it has been pending for a number of

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<sup>138</sup> 47 C.F.R. § 25.165(c).

<sup>139</sup> *Space Station License Reform Order*, 18 FCC Rcd at 10825.

<sup>140</sup> *contactMEO March Amendment*, Attachment A.

<sup>141</sup> *contactMEO March Amendment*, Attachment A, at 4.

<sup>142</sup> *contactMEO March Amendment*, Attachment A, at 5.

<sup>143</sup> *contactMEO March Amendment*, Attachment A, at 6.

<sup>144</sup> *contactMEO March Amendment*, at 11, 14.

<sup>145</sup> In addressing this issue, the International Bureau has referred to the definition of "public safety services" set forth in section 338 of the Communications Act of 1934. See *Mobile Satellite Ventures Subsidiary LLC, Order and Authorization*, DA 05-50 (Rel. Jan. 10, 2005). For purposes of allocating spectrum between 746 megahertz and 806 megahertz, the Act defines public safety services as services "the sole or principal purpose of which is to protect the safety of life, health, or property, that are provided by ... governmental entities or by nongovernmental organizations that are authorized by a governmental entity whose primary mission is the provision of such services and that are not make commercially available to the public by the provider." 47 C.F.R. § 338 (f)(1).

years.<sup>146</sup> contactMEO also made this assertion before the Commission in its reconsideration of the *First Space Station Licensing Reform Order*. In the *Reconsideration Order*, the Commission lowered the bond requirement but affirmed its necessity as a means to ensure that licensees remain committed and capable of implementing their systems once they receive licenses.<sup>147</sup>

57. As a result, we require contactMEO to post a bond for its licensed system. Pursuant to section 25.165, satellite systems with GSO and NGSO components operating in the same frequencies are subject to a \$5 million bond requirement.<sup>148</sup> Accordingly, contactMEO must post a bond for \$5 million within 30 days of the grant of this license. Failure to do so will render the authorizations for the entire system – both the GSO and NGSO components – null and void.

## 6. Application Fees

58. contactMEO filed its GSO satellite applications in the form of an amendment to its NGSO system application. As noted above, however, we considered contactMEO's GSO satellite requests separately from its NGSO satellite requests because GSO and NGSO satellites are subject to different rules and technical requirements. GSO and NGSO satellites are also subject to different application fees.<sup>149</sup> Consistent with these distinctions, we assign each GSO satellite and the NGSO constellation different call signs and license them with separate conditions. In addition, we conclude that contactMEO should have filed a separate application for each of its four GSO satellites instead of filing an amendment to its NGSO application. Accordingly, as a condition to contactMEO's GSO satellite licenses, we require contactMEO to submit the GSO satellite application fees for its four satellites that would have been due in March 2004, a total of \$393,170, within 30 days of the release date of this Order.<sup>150</sup> Failure to do so will render the four GSO authorizations null and void.

## IV. CONCLUSION AND ORDERING CLAUSES

59. Upon review of contactMEO's application, as amended, we find that contactMEO Communications, LLC is qualified to be a Commission licensee and that, pursuant to section 309 of the Communications Act of 1934, as amended, 47 U.S.C. §309, grant of this application will serve the public interest, convenience, and necessity.

60. Accordingly, IT IS ORDERED, that Application File Nos. SAT-LOA-19971222-00222, SAT-LOA-20040322-00234, 00235, 00236, 00237, as amended by File Nos. SAT-AMD-20031030-00317, SAT-AMD-20040322-00057, SAT-AMD-200400719-00141, ARE GRANTED, to the extent indicated herein, and subject to the conditions specified in this Order.

61. IT IS FURTHER ORDERED, that contactMEO Communications, LLC is authorized to construct three NGSO FSS satellites (Call Sign S2346) capable of using the 28.6-29.1 GHz (uplink) and 18.8-19.3 GHz (downlink) frequency bands on a primary basis, and to use the 29.5-30.0 GHz (uplink)

<sup>146</sup> *contactMEO March Amendment*, Attachment A, at 9.

<sup>147</sup> *Space Station Licensing Reform Order, First Order on Reconsideration*, 19 FCC Rcd at 12663.

<sup>148</sup> 47 C.F.R. § 25.165. See *Space Station Licensing Reform Order, First Order on Reconsideration*, 19 FCC Rcd at 12655.

<sup>149</sup> As implemented in 47 C.F.R. § 1.1107(9) & (10), the Omnibus Reconciliation Act of 1989, Pub. L 101-239, 47 U.S.C. § 158, contains separate application fees for NGSO licenses (per system of technically identical satellites) and GSO licenses (per satellite).

<sup>150</sup> The application fee per GSO satellite at the time contactMEO filed its amended application in March 2004 was \$98,645. Thus, the fee for four GSO satellites was \$394,580. Because contactMEO already paid a \$1,410 amendment application fee, we require contactMEO to submit the balance of \$393,170.

frequency band on a secondary basis. This authorization is subject to the technical specifications in contactMEO Communications, LLC's application, the Commission's rules, unless waived herein, and the terms and conditions in this Order.

62. IT IS FURTHER ORDERED, that contactMEO Communications, LLC's request for a waiver of the Ka-Band Plan is GRANTED, and contactMEO is authorized to construct three NGSO FSS satellites.

63. IT IS FURTHER ORDERED that contactMEO Communications, LLC must submit, prior to May 30, 2008, an application to modify its authorization for construction specifying its end-of-life operations for its NGSO FSS satellites. Upon grant of this application, contactMEO will be authorized to launch and operate its NGSO FSS satellites as specified in this Order. Coordination with all Federal FSS systems and other operational NGSO FSS licensees must be completed prior to launch of contactMEO's first NGSO FSS satellite.

64. IT IS FURTHER ORDERED, that upon Commission approval of contactMEO's modification application specifying its end-of-life operations, contactMEO will be authorized to operate its NGSO FSS satellites in the 19.7-20.2 GHz band for its downlinks on a non-conforming basis. As a non-conforming user, contactMEO must accept any interference from any non-Federal or Federal station authorized to use the 19.7-20.2 GHz band. In addition, contactMEO shall not cause harmful interference to any authorized space station operating in compliance with the Table of Allocations and the Ka-band plan, or authorized Federal FSS GSO or NGSO system. contactMEO shall immediately cease operations upon notification of such harmful interference resulting from its operations. contactMEO Communications, LLC's NGSO FSS satellite operations are subject to the sharing method with non-Federal systems specified in 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 (2003), and to completing coordination with Federal systems under 47 C.F.R. § 2.106, US 334 .

65. IT IS FURTHER ORDERED, that contactMEO Communications, LLC is authorized to construct, launch, and operate four GSO FSS satellites, one each at the following locations: 83° W.L. (Call Sign S2680); 121° W.L. (Call Sign S2681); 34° E.L. (Call Sign S2682); and 130° E.L. (Call Sign S2683), subject to the technical specifications in its application, the Commission's rules, unless waived herein, and the terms and conditions in this Order.

66. IT IS FURTHER ORDERED, that contactMEO Communications, LLC may operate its GSO FSS satellites in the 28.6-29.1 GHz frequency (uplink) band on a secondary basis, and in the 18.8-19.3 GHz band on a non-conforming basis. As a non-conforming user, contactMEO Communications must accept any interference from any non-Federal or Federal station authorized to use the 18.8-19.3 GHz frequency (downlink) band. In addition, contactMEO shall not cause harmful interference to any authorized non-Federal space station operating in compliance with the Table of Allocations and the Ka-band plan, or authorized Federal FSS GSO or NGSO system, and shall immediately cease operations upon notification of such harmful interference resulting from its operations.

67. IT IS FURTHER ORDERED, that contactMEO Communications, LLC's request to waive 47 C.F.R. § 25.202(g) to allow Tracking, Telemetry and Command (TT&C) operations for transfer orbits and on-orbit emergency modes in the 3650-3700 MHz band for its downlinks and 6425-6525 MHz band for its uplinks, is DENIED. contactMEO Communications LLC must, within 30 days of this Order, file a modification application specifying the exact Ka-band frequencies for these TT&C operations in accordance with 47 C.F.R. § 25.202(g).

68. IT IS FURTHER ORDERED that contactMEO Communications, LLC's authorization shall become NULL and VOID with no further action on the Commission's part in the event its space stations are not constructed, launched, and placed into operation in accordance with the technical



parameters and terms and conditions of this authorization by the following dates:

NGSO FSS Satellite Milestones:

<b>Milestone</b>	<b>Deadline</b>
Enter Non-contingent Satellite Manufacturing Contract	April 15, 2007
Complete Critical Design Review	April 15, 2008
Begin Physical Construction of First Satellite	October 15, 2008
Complete Construction and Launch First Satellite in System	October 15, 2009
Certify Entire System Operational	April 15, 2012

GSO FSS Satellite Milestones:

<b>Milestone</b>	<b>Deadline</b>
Enter Non-contingent Satellite Manufacturing Contract	April 15, 2007
Complete Critical Design Review	April 15, 2008
Begin Physical Construction of All Satellites	April 15, 2009
Certify Entire System Operational	April 15, 2011

69. IT IS FURTHER ORDERED that contactMEO Communications, LLC must coordinate its Ka-band downlink operations with U.S. Federal systems, including Federal operations to earth stations in foreign countries, in accordance with footnote US 334 to the Table of Frequency Allocations, 47 C.F.R. § 2.106. In addition to meeting the terms of the coordination agreement, the non-conforming contactMEO GSO operations at 18.8-19.3 GHz and NGSO operations at 19.7-20.2 GHz, shall not cause harmful interference to, nor claim protection from, present and future Federal, non-Federal, International GSO and NGSO systems or any non-conforming services previously authorized on a non-harmful interference basis.

70. IT IS FURTHER ORDERED, that contactMEO Communications, LLC shall operate its GSO FSS satellites in the 18.8-19.3 GHz band consistent with the power flux-density requirements of 47 C.F.R. § 25.208(e) and ITU Article 21 (Table 21-4).

71. IT IS FURTHER ORDERED, that contactMEO Communications, LLC shall operate its NGSO FSS satellites in the 18.8-19.3 GHz band consistent with the power flux-density requirements of 47 C.F.R. § 25.208(e) and ITU Article 21 (Table 21-4).

72. IT IS FURTHER ORDERED, that contactMEO Communications, LLC shall operate its NGSO FSS satellites in the 19.7-20.2 GHz and 29.5 -30.0 GHz bands consistent with the equivalent power flux-density requirements of ITU Article 22 (Tables 22-1C, 22-2), and in the 19.7-20.2 GHz band consistent with the operational equivalent power flux-density requirements of ITU Article 22 (Table 22-4B).

73. IT IS FURTHER ORDERED that contactMEO Communications, LLC's NGSO FSS satellite system in the 19.7-20.2 GHz band shall coordinate with specific earth stations in geostationary-satellite networks in the fixed-satellite service, either within the U.S. for domestic service or any points outside the U.S. for international service, under No. 9.7A of Article 9 of the ITU Radio Regulations.

74. IT IS FURTHER ORDERED that the license term for the GSO FSS space stations and the NGSO FSS space stations is fifteen years, as set forth in 47 C.F.R. § 25.121.

75. IT IS FURTHER ORDERED that contactMEO Communications, LLC shall, in accordance with 47 C.F.R § 25.111(b), prepare the necessary information for submission to the ITU to initiate and complete the advance publication, international coordination, due diligence, and notification process of this satellite system, in accordance with the ITU Radio Regulations. contactMEO Communications LLC shall be held responsible for all cost recovery fees associated with these ITU filings. No protection from interference caused by radio stations authorized by other administrations is guaranteed unless coordination and notification procedures are timely completed or, with respect to individual administrations, by successfully completing coordination agreements. Any radio station authorization for which coordination has not been completed may be subject to additional terms and conditions as required to effect coordination of the frequency assignments of other administrations.

76. IT IS FURTHER ORDERED that contactMEO Communications, LLC shall maintain an electronic web site bulletin board to list the satellite ephemeris data, for each satellite in the NGSO constellation, using the North American Aerospace Defense Command (NORAD) two-line orbital element format. The orbital elements shall be updated at least once every three days.

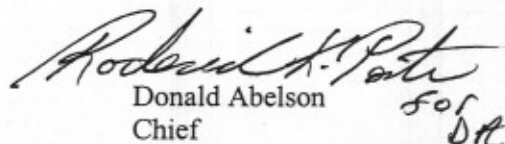
77. IT IS FURTHER ORDERED, that contactMEO Communications, LLC's request for a full or partial waiver of the Commission's bond requirement, 47 C.F.R § 25.165, is DENIED. contactMEO Communications LLC must file a performance bond with the Commission in the amount of \$5 million, pursuant to the procedures set forth section 25.165 of the Commission's rules, within 30 days of the grant of this Order and Authorization.

78. IT IS FURTHER ORDERED, that contactMEO Communications, LLC must submit applications fees for its GSO FSS satellites in the amount of \$393,170.00 within 30 days of the grant of this Order and Authorization.

79. IT IS FURTHER ORDERED that contactMEO Communications, LLC is afforded thirty days from the date of the release of this order and authorization to decline this authorization as conditioned. Failure to respond within that period will constitute formal acceptance of the authorization as conditioned.

80. This Order is issued pursuant to section 0.261 of the Commission's rule on delegated authority, 47 C.F.R. § 0.261, and is effective upon release.

## FEDERAL COMMUNICATIONS COMMISSION

  
Donald Abelson  
Chief  
International Bureau