

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

In the Matter of

Application of Harris CapRock	)	
Communications, Inc. for a 60-Day	)	
Special Temporary Authorization (“STA”)	)	Call Sign: E060157
to Operate Earth Stations Onboard Vessel	)	
(“ESV”) Terminals in the 27.6-28.4 GHz	)	File No:
(Earth-to-space), 28.6-29.1 (Earth-to-space),	)	
17.8-18.6 GHz (space-to-Earth) and 18.8-	)	
19.3 GHz (space-to-Earth) Frequency Bands	)	

**Application for Special Temporary Authorization**

Harris CapRock Communications, Inc. (“Harris CapRock”), pursuant to Section 25.120 of the Commission’s Rules, 47 C.F.R. § 25.120, seeks a 60-day special temporary authorization (“STA”) to operate certain earth station onboard vessel (“ESV”) terminals – Harris CapRock’s new 2.4m multi-band SpaceTrack (Model ST5000-2.4) – in the 27.6-28.4 GHz (Earth-to-space) band, 28.6-29.1 GHz (Earth-to-space) band, 17.8-18.6 GHz (space-to-Earth) band and 18.8-19.3 GHz (space-to-Earth) band while communicating with O3b Limited’s (“O3b”) Ka-band non-geostationary satellite orbit (“NGSO”) fixed-satellite service (“FSS”) system. Harris CapRock seeks this 60-day STA to permit operation of the ST5000-2.4 during the pendency of its concurrently filed 180-day STA application<sup>1</sup> and is consistent with a license modification application for long-term operating authority that will be filed shortly.

The ST5000-2.4 terminal will operate on U.S.-registered and non-U.S. registered maritime vessels and enhance Harris CapRock’s authorized ESV network, which provides a wide array of essential satellite communications services to vessels in motion, stationary oil drilling platforms and mobile rigs. As discussed herein, grant of the

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<sup>1</sup> See Application of Harris CapRock Communications, Inc. for a 180-Day Special Temporary Authorization (“STA”) to Operate an Earth Stations Onboard Vessel (“ESV”) Terminal in the 27.6-28.4 GHz (Earth-to-space), 28.6-29.1 (Earth-to-space), 17.8-18.6 GHz (space-to-Earth) and 18.8-19.3 GHz (space-to-Earth) Frequency Bands (filed February 24, 2016) (“180-day STA Application”).

requested STA and associated waivers to permit Ka-band maritime operations is consistent with Commission precedent and would strongly serve the public interest. Harris CapRock seeks an STA for a period of up to 60 days commencing on Monday, February 29, 2016, or as soon as practicable thereafter.

## **I. BACKGROUND**

As the Commission is aware, Harris CapRock has been engaged in extensive development and testing of its ST5000-2.4 terminal,<sup>2</sup> an innovative maritime earth station terminal designed to communicate in C-band, Ku-band and Ka-band FSS frequencies. Harris CapRock has filed a commercial modification application to authorize the ST5000-2.4 terminal to operate in C-band and Ku-band frequencies,<sup>3</sup> the pendency of which effectively precludes the filing of another modification application to add Ka-band operational authority and necessitates this request to enable the ST5000-2.4 terminal to communicate O3b's Ka-band NGSO FSS system. Harris CapRock intends to file a license modification application to authorize long-term Ka-band operations of the ST5000-2.4 terminal at the earliest practicable time.

The Technical Appendix and draft FCC Form 312 and Schedule B contain relevant information relating to the technical parameters, antenna performance information, radiation hazard analysis and general antenna specifications for the ST5000-2.4 terminal. Harris CapRock requests a waiver of certain rules necessary to facilitate ST5000-2.4 Ka-band operations in the maritime context as proposed herein. Furthermore, Harris CapRock's operations of the ST5000-2.4 terminal will be consistent with the terms and conditions imposed on ESV terminal operations with the O3b system.

### **A. O3b's NGSO FSS System**

In 2015, the Commission granted O3b's Petition for Declaratory Ruling seeking market access to serve the United States.<sup>4</sup> In that application, O3b submitted a Schedule

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<sup>2</sup> See, e.g., Harris CapRock, File No. 0734-EX-ST-2015 (authorization expired Jan. 22, 2016); File No. 0454-EX-ST-2015 (authorization expired Nov. 12, 2015).

<sup>3</sup> See Harris CapRock, File Nos. SES-MOD-20150915-00599 & SES-AMD-20151205-00907 (Call Sign E060157) ("*Pending Modification Application*").

<sup>4</sup> See O3b Limited, File No. SAT-LOI-20141029-00118, Call Sign S2935 (granted Jan. 22, 2015).

S describing the technical characteristics of its satellite system. Harris CapRock will operate the ST5000-2.4 terminals consistent with the technical parameters outlined in the O3b Schedule S.

The Commission has granted Ka-band ESV operating authority to O3b for maritime operations nearly identical to those proposed herein. In May 2014, the Commission granted O3b a blanket ESV license and a related waiver to operate one hundred ESV terminals on U.S. and non-U.S.-registered vessels in NGSO primary Ka-band spectrum, 28.6-29.1 GHz (Earth-to-space) band and 18.8-19.3 GHz (space-to-Earth) band.<sup>5</sup> In September 2014, the Commission granted authority to O3b to operate ESV terminals on three non-U.S.-registered vessels in GSO primary Ka-band spectrum, 28.35-28.4 GHz (Earth-to-space) band and 18.3-18.6 GHz (space-to-Earth).<sup>6</sup> In May 2015, the Commission granted O3b maritime operating authority to operate terminals on six non-U.S.-registered maritime vessels in the local multipoint distribution service (“LMDS”) primary uplink band, the 27.6-28.35 GHz (Earth-to-space), and the fixed service (“FS”) primary downlink band, 17.8-18.3 GHz (space-to-Earth).<sup>7</sup> Most recently, in January 2016, the Commission granted O3b a waiver to operate on up to thirty foreign-flagged vessels in the in the 27.6-28.4 GHz, 17.8-18.6 GHz and 18.8-19.3 GHz bands.<sup>8</sup>

The foregoing constitutes extensive precedent for Commission licensing of Ka-band maritime terminals to communicate with O3b’s NGSO FSS system. The proposed

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<sup>5</sup> See O3b Limited, File No. SES-LIC-20130528-00455 (Call Sign E130098); Letter from Jose Albuquerque, Chief, Satellite Division and Mark Settle, Chief, Policy and Rules Division, to Joslyn Read, O3b Limited, DA 14-637 (rel. May 13, 2014).

<sup>6</sup> See File No. SES-MS-20140318-00150, Letter from Jose Albuquerque, Chief, Satellite Division and Mark Settle, Chief, Policy and Rules Division, to Suzanne Malloy, O3b Limited, DA 14-1369 (rel. September 22, 2014).

<sup>7</sup> See SES-MS-20150206-00066, Letter from Jose Albuquerque, Chief, Satellite Division and Mark Settle, Chief, Policy and Rules Division, to Suzanne Malloy, O3b Limited, DA 15-601 (rel. May 20, 2015).

<sup>8</sup> See File No. SES-MS-20151021-00760, Letter from Jose Albuquerque, Chief, Satellite Division and Mark Settle, Chief, Policy and Rules Division, to Suzanne Malloy, O3b Limited, DA 16-99 (rel. January 29, 2016).

operations of the ST5000-2.4 terminal are virtually identical to those authorized in the Commission decisions noted above, and thus can be authorized on the same basis as the prior grants to O3b. Grant of the requested STA will enhance competition and enable more efficient provision of critical communications services to government users and commercial customers in the maritime, oil and gas, and other industries.

Harris CapRock notes that O3b has previously completed all necessary coordination with U.S. government satellite networks operating in the Ka-band, including GSO and NGSO networks. O3b has also completed coordination with the U.S. government under footnote US334 of the United States Table of Frequency Allocations (“Table of Allocations”). Harris CapRock’s proposed operations will be in accordance with all existing and future coordination agreements between O3b and other authorized Ka-band spectrum users. Finally, Harris CapRock will operate pursuant to the terms of O3b’s U.S. market access grant and, to the extent relevant, will fully satisfy any conditions of the grant to communicate with O3b’s NGSO system.<sup>9</sup>

## **II. SPECTRUM USE**

The Table of Allocations and the Commission’s Ka-band Plan (“Ka-band Plan”) identify various spectrum allocations for NGSO FSS operations but no rules have been adopted for mobile earth stations or ESV operations in these bands. In the absence of such rules, Harris CapRock intends to operate the ST5000-2.4 terminal on a non-conforming (unprotected and non-interference) basis at all times when the terminals are in motion. When the ESVs are stationary, Harris CapRock will operate the ST5000-2.4 in accordance with the Table of Allocations and Ka-band Plan or, to the extent necessary, seek a limited waiver of the Commission’s Rules to operate the terminal on a non-conforming basis. Because the Commission has not adopted technical rules governing Ka-band ESV maritime operations, Harris CapRock will comply with the Commission’s general rules and policies governing Ku-band ESV operations.<sup>10</sup>

Harris CapRock seeks to communicate with O3b’s Ka-band NGSO FSS system in

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<sup>9</sup> See O3b Limited, File No.SAT-LOI-20141029-00118 (Call Sign S2935) (granted Jan. 22, 2015).

<sup>10</sup> See 47 C.F.R. 25.222; Technical Appendix, IV & V (Tracking Report).

the following bands: 27.6-28.4 GHz (Earth-to-space), 28.6-29.1 GHz (Earth-to-space), 17.8-18.6 GHz (space-to-Earth) and 18.8-19.3 GHz (space-to-Earth). Issues associated with Ka-band maritime terminal operations in these band segments are discussed below.

**A. Uplink Frequencies and Ka-band Designation**

***a. Primary NGSO FSS Uplink***

The Table of Allocations and Ka-band Plan provide that the 28.6-29.1 GHz (Earth-to-space) band may be used by NGSO FSS systems on a primary basis and by GSO FSS systems on a secondary basis.<sup>11</sup> Accordingly, when the ESVs are stationary, Harris CapRock will operate the ESVs on a primary basis in the 28.6-29.1 GHz band. When the ESVs are in motion, however, Harris CapRock intends to operate the ST5000-2.4 terminal on a non-conforming (unprotected and non-interference) basis.

As discussed in Section III, below, Harris CapRock respectfully requests a waiver of the Table of Allocations, 47 C.F.R. §2.106, and Ka-band Plan to the extent necessary to permit its non-conforming use of the 28.6-29.1 GHz band.<sup>12</sup> Harris CapRock demonstrates that it can operate the ST5000-2.4 terminal without causing harmful interference to authorized spectrum users and agrees to accept any harmful interference from other services while operating on a non-conforming, unprotected basis. In addition, Harris CapRock will not claim protection from conforming uses of the 28.6-29.1 GHz band while the ESVs are in motion.

***b. Secondary NGSO FSS Uplink***

The Commission's Table of Allocations and Ka-band Plan provide that LMDS systems operate on a primary basis and FSS systems on a secondary basis in the 27.5-

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<sup>11</sup> *In the Matter of 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*, 11 FCC Rcd. 19005, ¶¶ 57-58 and 78 (1996) (“Ka-band Plan R&O”). See also *In the Matter of Redesignation of the 17.7-19.7 GHz Frequency Band, Blanket Licensing of Satellite Earth Stations in the 17.7-20.2 GHz and 27.5-30.0 GHz Frequency Bands, and the Allocation of Additional Spectrum in the 17.3-17.8 GHz and 24.75-25.25 GHz Frequency Bands for Broadcast Satellite-Service Use*, 15 FCC Rcd 13430, ¶¶ 28 and 34 (2000) (“Redesignation of Ka-band Plan R&O”).

<sup>12</sup> See United States Table of Frequency Allocations, 47 C.F.R. §2.106.

28.35 GHz (Earth-to-space) band.<sup>13</sup> In addition, GSO FSS systems operate on a primary basis and NGSO FSS systems operate on a secondary basis in the 28.35-28.4 GHz (Earth-to-space) band.<sup>14</sup>

Accordingly, when the ESVs are stationary, Harris CapRock will operate the ST5000-2.4 terminal on a secondary, non-harmful interference basis to LMDS in the 27.6-28.35 GHz band and to GSO FSS systems in the 28.35-28.4 GHz band. When the terminal is in motion, however, Harris CapRock will operate the ST5000-2.4 on a non-conforming (unprotected and non-interference) basis.

Harris CapRock notes that its proposed operations in the 27.6-28.35 GHz band are consistent with the Commission's view on the type of FSS operations that would not cause harmful interference to primary LMDS stations in the band. The Commission has previously stated that FSS operations in this band are limited to "gateway-type" operations.<sup>15</sup> The Commission's main concern is ubiquitous terminals that could interfere with LMDS operations.<sup>16</sup> Although the rules limit operations in some bands to gateway earth stations only, the 27.5-28.35 GHz band is not among them and there is no requirement that earth stations actually serve as gateways.

Harris CapRock's proposed stationary ESV operations at a small number of port and offshore locations will be limited in scope and consistent with the Commission's views on high data-rate, gateway-type operations. The Commission has previously

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<sup>13</sup> See *Ka-band Plan R&O* ¶¶ 59-62; see also *Redesignation of Ka-band R&O* ¶ 28.

<sup>14</sup> *Ka-band Plan R&O* ¶ 42; see also *Redesignation of Ka-band Plan R&O* ¶ 28.

<sup>15</sup> The Commission's references to "gateway-type" service in the 27.5-28.35 GHz band are not intended as a requirement that all earth stations in the band serve as gateway earth stations. Rather, the mention of "gateway-type" service in the 27.5-28.35 GHz band serves as an example of what the Commission's envisions as the type of service that FSS operators would be able to provide on a secondary basis without causing interference to primary LMDS stations in the band.

<sup>16</sup> *In the Matter of 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*, 12 FCC Rcd 22310, 22327, ¶ 42 (1997).

recognized that Ka-band maritime earth station operations are consistent with its view of “gateway-type” operations.<sup>17</sup> Accordingly, Harris CapRock can be permitted to operate on a secondary basis to LMDS in the 27.6-28.35 GHz band.

As a secondary user, Harris CapRock’s proposed NGSO FSS operations in the 27.6-28.35 GHz band must not cause interference to primary LMDS stations. The attached Comsearch coordination reports demonstrate that Harris CapRock may operate the ST5000-2.4 terminal without causing harmful interference to LMDS licensees. Harris CapRock has completed coordination of its proposed Ka-band ESV operations in the 27.6-28.35 GHz band with existing terrestrial licenses in the port areas where equipped vessels will be docked.<sup>18</sup> No objections were received from incumbent licensees. Furthermore, Harris CapRock agrees not to cause harmful interference to future primary LMDS operations in the band and will accommodate any future LMDS licensees to the extent necessary to avoid harmful interference.

As a secondary user in the 28.35-28.4 GHz band, Harris CapRock must operate the ST5000-2.4 terminal on a secondary basis to GSO FSS system and not cause harmful interference to U.S.-licensed GSO FSS operations. Harris CapRock will operate the terminal consistent with the off-axis EIRP limits specified in Section 25.138 of the Commission’s Rules to ensure no interference with GSO FSS Ka-band satellite operations.<sup>19</sup> Furthermore, as discussed, the ST5000-2.4 terminal is designed to meet certain FCC ESV operational requirements for Ku-band ESVs, including the pointing accuracy, automatic cessation and recording requirements.<sup>20</sup> Finally, O3b has demonstrated that operations of its Ka-band NGSO system comply with relevant

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<sup>17</sup> See O3b Limited, File No. SES-MS-20150206-00066.

<sup>18</sup> Frequency coordination reports have been completed for port locations in Fort Lauderdale, Florida, Miami, Florida, Port Canaveral, Florida and San Juan, Puerto Rico. See Technical Appendix, VII.

<sup>19</sup> See 47 C.F.R. § 25.138; Technical Appendix, I.

<sup>20</sup> See Technical Appendix, V.

Equivalent Power Flux Density (“EPFD”) uplink limits,<sup>21</sup> thus providing the required level of protection to GSO FSS systems.

When the ST5000-2.4 is in motion, Harris CapRock intends to operate the terminal on a non-conforming (unprotected and non-interference) basis in the 27.6-28.4 GHz band. As discussed in Section III, below, Harris CapRock respectfully requests a waiver of the Table of Allocations, 47 C.F.R. §2.106, and Ka-band Plan to the extent necessary to permit its non-conforming use of the 27.6-28.4 GHz band.<sup>22</sup> Harris CapRock demonstrates that it can operate the ST5000-2.4 terminal without causing harmful interference to authorized spectrum users and agrees to accept any harmful interference from other services while operating on a non-conforming, unprotected basis. In addition, Harris CapRock will not claim protection from conforming uses of the 27.6-28.4 GHz band while the ESVs are in motion.

## **B. Downlink Frequencies and Ka-band Designation**

### ***a. Primary NGSO FSS Downlink***

The Table of Allocations and the Commission’s Ka-band Plan provide that the 18.8-19.3 GHz (space-to-Earth) band may be used by NGSO FSS operations on a primary basis.<sup>23</sup> Accordingly, when the ESVs are stationary, Harris CapRock will operate the ESVs on a primary basis in the 18.8-19.3 GHz band. Because the Commission has not adopted rules governing Ka-band terminal operations onboard maritime vessels, Harris CapRock intends to operate the ESVs on a non-conforming basis when the vessels are in motion.

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<sup>21</sup> See O3b Limited, File No. SES-MS-20150206-00066, Technical Appendix A.7; *contactMEO Communications, LLC*, 21 FCC Rcd 4035, 4043-4044 (IB 2006) (where the Commission held that compliance with the ITU’s EPFD limits provides a sufficient basis for an NGSO FSS system to operate on a non-interference basis in a band in which GSO FSS systems are primary).

<sup>22</sup> See United States Table of Frequency Allocations, 47 C.F.R. §2.106.

<sup>23</sup> See *Ka-band Plan R&O* ¶¶ 59-62; see also *Redesignation of Ka-band R&O* ¶ 28. Note that low power point-to-multipoint terrestrial fixed systems may continue to be licensed and operate on a co-primary basis with NGSO/FSS in the 18.82-18.87 GHz and 19.16-19.21 GHz bands.



As discussed in Section III, below, Harris CapRock respectfully requests a waiver of the Table of Allocations, 47 C.F.R. §2.106, and Ka-band Plan to the extent necessary to permit its non-conforming use of the 18.8-19.3 GHz band.<sup>24</sup> Harris CapRock demonstrates that it can operate the ST5000-2.4 terminal without causing harmful interference to authorized spectrum users and agrees to accept any harmful interference from other services while operating on a non-conforming, unprotected basis. In addition, Harris CapRock will not claim protection from conforming uses of the 18.8-19.3 GHz band while the ESVs are in motion.

***b. Downlink with No NGSO FSS Allocation***

The Table of Allocations and the Commission's Ka-band Plan provide that the 17.8-18.3 GHz band may be used by FS systems on a primary basis and NGSO FSS systems are non-conforming.<sup>25</sup> Similarly, the Table of Allocations and Ka-band Plan provide that in the 18.3-18.6 GHz band, FSS services are limited to GSO FSS operations.<sup>26</sup> Accordingly, Harris CapRock will operate its ESVs on a non-conforming basis while stationary or in motion in the 17.8-18.6 GHz band.

As discussed in Section III, below, Harris CapRock respectfully requests a waiver of the Table of Allocations, 47 C.F.R. §2.106, and Ka-band Plan to the extent necessary to permit its non-conforming use of the 17.8-18.6 GHz band.<sup>27</sup> Harris CapRock demonstrates that it can operate the ST5000-2.4 terminal without causing harmful interference to authorized spectrum users and agrees to accept any harmful interference from other services while operating on a non-conforming, unprotected basis. In addition, Harris CapRock will not claim protection from conforming uses of the 17.8-18.6 GHz band while the ESVs are in motion.

**III. WAIVER REQUESTS**

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<sup>24</sup> See United States Table of Frequency Allocations, 47 C.F.R. §2.106.

<sup>25</sup> See *Redesignation of Ka-band Plan R&O ¶¶ 28 and 34*.

<sup>26</sup> *Id.*; see United States Table of Frequency Allocations, footnote NG164.

<sup>27</sup> See United States Table of Frequency Allocations, 47 C.F.R. §2.106.

Harris CapRock is seeking a waiver of the U.S. Table of Frequency Allocations, 47 C.F.R. § 2.106, and the Commission's Ka-band plan to the extent necessary to permit non-conforming operation of the ST5000-2.4 terminal. In considering requests for non-conforming uses, the Commission has indicated it would grant such waivers when there is little potential for interference into any service authorized under the Table of Allocations and when the non-conforming operator accepts any interference from authorized services.<sup>28</sup> In the following sections, Harris CapRock demonstrates it can operate the ST5000-2.4 terminal on a non-conforming basis consistent with Commission policies and precedent.

#### **A. 28.6-29.1 GHz Uplink Band**

When the ESVs are in motion, Harris CapRock proposes to operate the ST5000-2.4 terminal on a non-conforming basis in the 28.6-29.1 GHz band. Harris CapRock will not claim protection from conforming uses of the spectrum while the ESVs are in motion and agrees to accept any harmful interference from other services. In addition, Harris CapRock will immediately terminate its ESV operations upon notification that such operations are not permitted under the terms of a coordination agreement with, or are causing harmful interference to, any lawfully operating radio system in the 28.6-29.1 GHz band in conformance with the Table of Allocations. Harris CapRock's operations will be in accordance with any coordination agreement that has been or will be reached between O3b and other lawfully operating spectrum users.

There is little to no potential for interference to existing secondary GSO FSS systems in these bands.<sup>29</sup> While there are no rules for mobile maritime operations in the Ka-band, Harris CapRock will operate the proposed terminals within the off-axis EIRP limits specified in Section 25.138 of the Commission's Rules and will otherwise comply

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<sup>28</sup> See Letter from Jose Albuquerque, Chief, Satellite Division and Mark Settle, Chief, Policy and Rules Division, to Suzanne Malloy, O3b Limited, DA 14-1369 (rel. September 22, 2014); *Contactmeo Communications, LLC*, Order and Authorization, 21 FCC Rcd 4035, 4044 (IB 2006); *ViaSat AMSS Order*, File No. SES-MFS-20090624-00789; see also 47 C.F.R. § 1.3.

<sup>29</sup> There is no potential for interference into other NGSO FSS systems because O3b's system is currently the only authorized NGSO FSS system in the United States.

with the Commission's two-degree spacing policy.<sup>30</sup> As discussed in the attached Technical Appendix, the ST5000-2.4 terminal is designed to meet the FCC's requirements for Ku-band ESV operations, including: (i) pointing accuracy of 0.2° or better; (ii) automatic cessation of emissions within 100 ms if pointing offset exceeds 0.5°; and (iii) transmissions will not resume until pointing accuracy is within 0.2°.<sup>31</sup> Harris CapRock has also designed a system to record a vessel's location, transmit frequency, channel bandwidth and satellite used, which can be made available to a FSS operator within 24 hours of a request.

Article 22 of the ITU Radio Regulations sets forth standards for interference protection of GSO satellite networks from NGSO satellite systems. As previously demonstrated by O3b, operations of the subject Ka-band NGSO system comply with the relevant EPFD uplink limits in the 28.6-29.1 GHz band.<sup>32</sup> Harris CapRock will operate the ST5000-2.4 consistent with the EPFD limits of O3b's system to provide the required level of protection from GSO FSS systems operating in the 28.6-29.1 GHz band.

#### **B. 27.6-28.4 GHz Uplink Band**

When the ESVs are in motion, Harris CapRock proposes to operate the ST5000-2.4 terminal on a non-conforming basis in the 27.6-28.4 GHz band. Harris CapRock will not claim protection from conforming uses of the spectrum while the ESVs are in motion and agrees to accept any harmful interference from other services while operating on a non-conforming, unprotected basis. In addition, Harris CapRock will immediately terminate its ESV operations upon notification that such operations are not permitted under the terms of a coordination agreement with, or are causing harmful interference to, any lawfully operating radio system in the 27.6-28.4 GHz band in conformance with the Table of Allocations. Harris CapRock's operations will be in accordance with any

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<sup>30</sup> See 47 C.F.R. § 25.138; Technical Appendix, Section III.

<sup>31</sup> See Technical Appendix, IV. & V.

<sup>32</sup> See O3b Limited, File No. *See* File No. SES-LIC-20130528-00455, Technical Appendix, A.7; *contactMEO Communications, LLC*, 21 FCC Rcd 4035, 4043-4044 (IB 2006) (where the Commission held that compliance with the ITU's EPFD limits provides a sufficient basis for an NGSO FSS system to operate on a non-interference basis in a band in which GSO FSS systems are primary).

coordination agreement that has been or will be reached between O3b and other lawfully operating spectrum users.

There is little to no potential for interference to LMDS or GSO FSS operations from Harris CapRock's proposed ESV operations in the 27.6-28.4 GHz band. Not only has Harris CapRock coordinated the relevant port areas, but while the ESVs are in motion the subject vessels will be sufficient distance from the U.S. coastline to prevent harmful interference to potentially affected terrestrial licensees. In addition operations of the ST5000-2.4 will be consistent with the EPFD uplink limits in the 27.6-28.4 GHz band to protect authorized spectrum users pursuant to Article 22 of the ITU Radio Regulations.<sup>33</sup> Furthermore, Harris CapRock will operate the proposed terminals within the off-axis EIRP limits specified in Section 25.138 of the Commission's Rules and observe the Commission's Ku-band ESV requirements for pointing accuracy, recording and automatic cessation. Thus, while the ESVs are in motion, Harris CapRock can operate on a non-conforming basis without causing harmful interference to authorized GSO FSS or LMDS operations in the 27.6-28.4 GHz band.

### **C. 18.8-19.3 GHz Downlink Band**

When the ESVs are in motion, Harris CapRock proposes to operate the ST5000-2.4 terminal on a non-conforming basis in the 18.8-19.3 GHz band. Harris CapRock will not claim protection from conforming uses of the spectrum while the ESVs are in motion and agrees to accept any harmful interference from other services while operating on an unprotected, non-conforming basis. In addition, Harris CapRock will immediately terminate its ESV operations upon notification that such operations are not permitted under the terms of a coordination agreement with, or are causing harmful interference to, any lawfully operating radio system in the 18.8-19.3 GHz band in conformance with the Table of Allocations. Harris CapRock's operations will also be in accordance with any

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<sup>33</sup> See O3b Limited, File No. SES-MSC-20150206-00066, Technical Appendix A.7; *contactMEO Communications, LLC*, 21 FCC Rcd 4035, 4043-4044 (IB 2006) (where the Commission held that compliance with the ITU's EPFD limits provides a sufficient basis for an NGSO FSS system to operate on a non-interference basis in a band in which GSO FSS systems are primary).

coordination agreement that has been or will be reached between O3b and other lawfully operating spectrum users.

Because there are no other Ka-band NGSO FSS systems authorized in the United States, Harris CapRock's proposed operations will not cause harmful interference to other NGSO FSS systems. Furthermore, as previously demonstrated by O3b, operations of the subject Ka-band NGSO system comply with the relevant Power Flux Density ("PFD") downlink limits for the 18.8-19.3 GHz band designed to protect terrestrial FS services.<sup>34</sup> Harris CapRock's proposed ESV operations are consistent with the PFD limits of O3b's system and will provide the required level of protection from terrestrial FS systems operating in the 18.8-19.3 GHz band when the ESVs are in motion. Furthermore, the ESVs will operate within the off-axis EIRP limits specified in Section 25.138 of the Commission's Rules and observe the Commission's Ku-band ESV requirements for pointing accuracy, recording and automatic cessation to ensure no harmful interference to authorized FS operations.

#### **D. 17.8-18.6 GHz Downlink Band**

When the ESVs are stationary or in motion, Harris CapRock proposes to operate the ST5000-2.4 terminal on a non-conforming basis in the 17.8-18.6 GHz band. Harris CapRock will not claim protection from conforming uses of the spectrum while the ESVs are in motion and agrees to accept any harmful interference from other services while operating on an unprotected, non-conforming basis. In addition, Harris CapRock will immediately terminate its ESV operations upon notification that such operations are not permitted under the terms of a coordination agreement with, or are causing harmful interference to, any lawfully operating radio system in the 17.8-18.6 GHz band in conformance with the Table of Allocations. Harris CapRock's operations will be in accordance with any coordination agreement that has been or will be reached between O3b and other lawfully operating spectrum users.

There is no potential for the proposed operations to cause interference to other spectrum users because they are receive operations and would be the victim of

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<sup>34</sup> See O3b Limited, File No. SES-LIC-20130528-00455, Technical Appendix, A.5-A.7. Fixed Service stations in the United States operating in the 18.8-19.3 GHz band are no longer co-primary with FSS users in this band. (See 47 C.F.R. § 101.85(b)(2).)

interference from terrestrial transmit operations. As previously demonstrated by O3b, operations of its Ka-band NGSO system comply with the relevant PFD downlink limits for the 17.8-18.6 GHz band designed to protect terrestrial FS services.<sup>35</sup> Operations of the O3b system also comply with EPFD downlink limits in the 18.3-18.6 GHz band,<sup>36</sup> therefore providing the required level of protection from GSO FSS systems operating in the band. Furthermore, the ESVs will operate within the off-axis EIRP limits specified in Section 25.138 and observe the Commission's Ku-band ESV pointing accuracy, recording and automatic cessation requirements to ensure that there is no harmful interference to GSO FSS systems in this band.

#### **E. Waiver Precedent**

There is strong Commission precedent for granting the waivers requested herein. The Commission has granted virtually identical waivers to O3b for its non-conforming use of the Ka-band for maritime operations.<sup>37</sup> Harris CapRock's proposed ESV operations are fundamentally the same as O3b's authorized operations. The Commission also has granted similar waivers to enable Ka-band aeronautical operations in the absence of rules governing Ka-band earth stations aboard aircraft ("ESAAs").<sup>38</sup>

Harris CapRock has demonstrated that it can operate the ST5000-2.4 terminal in the maritime context on a non-conforming basis in each band without causing harmful interference to authorized users and agrees to accept any harmful interference from other authorized systems. Accordingly, grant of the requested waivers is consistent with Commission precedent and will not undermine other uses of the subject bands.

#### **IV. EXPEDITED CONSIDERATION**

Harris CapRock respectfully requests expedited processing of this STA request under Section 25.120. Section 25.120(a) provides that STA requests should be filed at

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<sup>35</sup> See O3b Limited, File No. SES-MSC-20150206-00066, Technical Appendix A.5

<sup>36</sup> *Id.* A.7

<sup>37</sup> See File No. SES-LIC-20130528-00455 (Call Sign E130098); File No. SES-MSC-20140318-00150; File No. SES-MSC-20150206-00066; File No. SES-MSC-20151021-00760; Section I.A.

<sup>38</sup> See ViaSat Authorization, File No. SES-LIC-20120427-00404, Call Sign E120075.

least three working days prior to the date of commencement of the proposed operations. Here, Harris CapRock is proposing to commence operations on Monday, February 29, 2016.

As the Commission is aware, the pendency of a separate modification application to add the ST5000-2.4 in the C-band and Ku-band to Harris CapRock's ESV license effectively precludes filing a new modification to add Ka-band operating authority to the license.<sup>39</sup> Harris CapRock has consulted with Commission staff and concluded, as a result of processing limitations within the International Bureau Filing System (IBFS), it is necessary to file requests for STA authority to support initial ST5000-2.4 Ka-band operations. Harris CapRock requests this 60-day STA to permit operation of the ST5000-2.4 during the pendency of its concurrently filed 180-day STA application, which will afford the Commission time to place the application on public notice for comment by interested parties.

Expeditious processing of this STA request will ensure that the substantial public benefits of ST5000-2.4 terminal operations can be realized until such time as Harris CapRock is able to file its contemplated modification application for long-term operating authority. Harris CapRock acknowledges that any action on the requested STA will not affect the Commission's ultimate determination with respect to the forthcoming modification application. Accordingly, Harris CapRock respectfully submits that the public interest will be served by grant of the requested STA commencing February 29, 2016.

## **V. PUBLIC INTEREST**

Grant of the requested 60-day STA will strongly serve the public interest. Authorizing operation of the ST5000-2.4 terminal will allow Harris CapRock to provide more robust broadband satellite communications services to a wide array of users, including vessels in motion, marine barges and remote oil platforms that may be unable to obtain communications services through alternative facilities. The ST5000-2.4 multi-band terminal also will enhance operational flexibility and available satellite capacity by utilizing Ka-band spectrum, in addition to other commercial FSS bands, to meet maritime

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<sup>39</sup> *See Pending Modification Application.*

customer needs. Users will be able to utilize high-speed Internet access, corporate VPN, e-mail, voice and other services, including emergency communications to support employees in remote locations, throughout international and U.S. waterways.

Near-term deployment of this terminal will also ensure that Harris CapRock (a U.S. equipment manufacturer and service provider) and other U.S. interests can participate more fully in the development of these important new services and improve competition among maritime service providers. Moreover, Harris CapRock has expended considerable effort in preparing equipment and personnel to facilitate near-term introduction of the ST5000-2.4 terminal and grant of the requested authority will allow commercial and government customers to benefit from the expansion of maritime satellite communications services.

### **C. CONCLUSION**

In view of the foregoing, the public interest would be served by a grant of the requested 60-day STA to allow Harris CapRock to operate the ST5000-2.4 terminal in the Ka-band with the O3b system as described herein by February 29, 2016 or at the earliest practicable time thereafter.