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

In the Matter of	)	
BLUE MARBLE NETWORK, LLC	)	
	)	File No. SES-LIC-20100917-01170
	)	File No. SES-AMD-20100_____
Application for Authority to Operate a Network of Earth Stations onboard Vessels in the Ku-band	)	Call Sign E100102

AMENDED APPLICATION FOR AUTHORITY

Blue Marble Network, LLC ("Blue Marble"), through this amendment to its pending application, requests authorization from the Federal Communications Commission ("FCC" or "Commission") to operate a network of very small aperture terminal ("VSAT") earth stations onboard vessels ("ESVs") that use the 10.95-12.750 GHz and 14.0-14.5 GHz ("Ku-band") frequency bands to communicate with an already authorized network hub station located in Napa, California. The network will deliver voice and data services. Specifically, this amendment provides updated information regarding power levels, clarifies how Blue Marble will coordinate with the National Telecommunications and Information Administration's Interdepartment Radio Advisory Committee, and specifies that Blue Marble is requesting a waiver to operate in the 12.2-12.75 GHz band.

I. DESCRIPTION OF NETWORK AND SCOPE OF OPERATIONS

Through the development of an ESV network, Blue Marble will be able to serve a customer base that will include transoceanic merchants shipping cargo using both U.S. and foreign-flagged vessels. The voice and data services that Blue Marble will provide will enable

its customers to supplement their existing communications systems to improve their internal operations and give their crew members an effective means for communicating offshore.

As permitted by the Commission's rules, Blue Marble seeks ALSAT authority for its ESV network. Initially, Blue Marble will offer extended Ku and Ku-band services using the GE-23 satellite located at 172º W.L.[1] Specifically, the network will use an iDirect Network Management System that will operate and control the ESV network as it offers services to customers onboard vessels in the Pacific Ocean and the west coast of the United States.

Blue Marble will use the VSAT network hub antenna currently licensed by the FCC to Intelsat under the call sign KA450. The hub station is a 9.0 m fixed earth station located in Napa, California. The hub station will control all network access. All access to the network is established, controlled and maintained by the hub station. Each remote station's power level and bandwidth allocation and network access is controlled by the hub station. The hub station will consist of a network management system operated from the Network Operations Center ("NOC") providing time division multiplexing ("TDM") modulation. All remotes will receive this TDM carrier and transmit in Time Division Multiple-Access ("TDMA") mode. All remote activity, including registration, bandwidth allocation, and bandwidth increases, are recorded and logged at the NOC. Network hub equipment will also monitor each ESV remote terminal for transmit status, location, satellite in use and frequency in use. The information will be stored on a server at the NOC as well as on a network management system ("NMS") system at the hub facility. This information will be available, as required by Commission rules, to the FCC or FSS space station operator within 24 hours of request.

[1] Blue Marble recognizes that the Commission has limited ALSAT authority to use of the regular Ku-band frequencies. To the extent Blue Marble seeks to use the extended Ku-band frequencies with any satellite other than GE-23, it will seek the appropriate changes to its authorization at that time.

Blue Marble's remote antennas are the Sea Tel models 4010 and 5010. The Sea Tel 4010 has a 1.0 m antenna and the Sea Tel 5010 has a 1.2 m antenna. Blue Marble requests authority to incorporate 250 of each antenna into its proposed network. Both can provide stabilized tracking as the antenna communicates with the Ku-band satellite. The antennas' main lobes comply with the standards specified in Sections 25.209(a-b) of the Commission's rules. **Exhibit D** demonstrates how the transmit power will allow Blue Marble's ESV system to meet the FCC's off-axis EIRP requirements for its hub facility. **Exhibit E** provides antenna patterns and off-axis emissions that conform with the Commission's ESV off-axis spectral density requirements.

Because its proposed operations will go beyond the limits of ITU Region 2 and span the Pacific Ocean, Blue Marble intends to use the receive frequencies of both the extended and the standard Ku-bands. Blue Marble will not claim protection from interference from any authorized terrestrial station to which the extended Ku-band frequencies are currently assigned or may be assigned in the future. When a Blue Marble customer operates an ESV in international waters it will operate in accordance with the FCC's procedures concerning FCC-licensed ESVs operating in international waters and near the coasts of other countries.

II. COMPLIANCE WITH THE COMMISSION'S ESV RULES

The table below details how Blue Marble meets each of the Commission's ESV requirements either by stating how Blue Marble will comply or by referencing the appropriate exhibit demonstrating compliance.

Section 25.222 Requirements

FCC Section 25.222 Requirement	Compliance
(a) Particulars of Operation – All Ku-band ESV licensees must comply with the requirements in either paragraph (a)(1) or (a)(2) of this section and all of the requirements set forth in paragraphs (a)(3)-(a)(7) of this section.	Blue Marble is choosing to comply with the requirements in (a)(1).
(1) The following requirements shall apply to an ESV that uses transmitters with off-axis EIRP spectral-densities lower than or	Blue Marble will uses transmitters compliant with this section.

FCC Section 25.222 Requirement	Compliance
equal to the levels in paragraph (A) of this subsection.	
(i) An ESV system shall not exceed the off-axis EIRP spectral-density limits and conditions defined in paragraphs (A)-(D) of this subsection.	Blue Marble will meet these limits and conditions as described below
(A) The off-axis EIRP spectral-density emitted from the ESV, in the plane of the GSO as it appears at the particular earth station location, shall not exceed the following values: 15 - 10log(N) - 25logθ dBW/4 kHz for $1.5° \leq \theta \leq 7°$ -6 -10log(N) dBW/4 kHz for $7° < \theta \leq 9.2°$ 18 -10log(N) - 25logθ dBW/4 kHz for $9.2° < \theta \leq 48°$ -24 -10log(N) dBW/4 kHz for $48° < \theta \leq 85°$ -14 -10log(N) dBW/4 kHz for $85° < \theta \leq 180°$	Exhibit C, EIRP Density Tables, demonstrates how Blue Marble meets this requirement.
(B) In all directions other than along the GSO, the off-axis EIRP spectral-density for co-polarized signals emitted from the ESV shall not exceed the following values: 18 - 10log(N) - 25logθ dBW/4 kHz for $3.0° \leq \theta \leq 48°$ -24 - 10log(N) dBW/4 kHz for $48° < \theta \leq 85°$ -14 - 10log(N)dBW/4 kHz for $85° < \theta \leq 180°$	Exhibit D, Antenna Patterns, demonstrates how Blue Marble meets this requirement.
(C) In all directions, the off-axis EIRP spectral-density for cross-polarized signals emitted from the ESV shall not exceed the following values: 5 - 10log(N) - 25logθ dBW/4 kHz for $1.8° \leq \theta \leq 7.0°$; -16 - 10log(N) dBW/4 kHz for $7.0° < \theta \leq 9.2°$	Exhibit D, Antenna Patterns, demonstrates how Blue Marble meets this requirement.
(D) For non-circular ESV antennas, the major axis of the antenna will be aligned with the tangent to the arc of the GSO at the orbital location of the target satellite, to the extent required to meet the specified off-axis EIRP spectral-density criteria.	Blue Marble's system does not include non-circular ESVs.
(ii) Each ESV transmitter must meet one of the following antenna pointing requirements: (A) Each ESV transmitter shall maintain a pointing error of less than or equal to 0.2° between the orbital location of the target satellite and the axis of the main lobe of the ESV antenna, or (B) Each ESV transmitter shall declare a maximum antenna pointing error that may be greater than 0.2° provided that the ESV does not exceed the off-axis EIRP spectral-density limits in paragraph (a)(1)(i) of this section.	Exhibit B, Declaration of Peter Blaney, Chief Engineer of Cobham SATCOM, Sea Tel, Inc., demonstrates compliance with subsection A of this requirement.
(iii) Each ESV transmitter must meet one of the following cessation of emission requirements: (A) For ESVs operating under paragraph (a)(1)(ii)(A) of this section, all emissions from the ESV shall automatically cease within 100 milliseconds if the angle between the orbital location of the target satellite and the axis of the main lobe of the ESV antenna exceeds 0.5°, and transmission will not resume until such angle is less than or equal to 0.2°, or (B) For ESV transmitters operating under paragraph (a)(1)(ii)(B) of this section, all emissions from the ESV shall automatically cease within 100 milliseconds if the angle	Exhibit B, Declaration of Peter Blaney, Chief Engineer of Cobham SATCOM, Sea Tel, Inc., demonstrates compliance with subsection A of this requirement.

FCC Section 25.222 Requirement	Compliance
between the orbital location of the target satellite and the axis of the main lobe of the ESV antenna exceeds the declared maximum antenna pointing error and shall not resume transmissions until such angle is less than or equal to the declared maximum antenna pointing error.	
(2) Requirements applicable to an ESV that uses off-axis EIRP spectral-densities in excess of the levels in paragraph (a)(1)(i) of this section.	This section does not apply as Blue Marble does not use off-axis EIRP spectral-densities in excess of the levels in paragraph (a)(1)(i).
(3) There shall be a point of contact in the United States, with phone number and address, available 24 hours a day, 7 days a week, with authority and ability to cease all emissions from the ESVs.	The point of contact is Peter Malcolm, Vice President of Engineering and Operations, 15110 Northwest Freeway, Suite 120, Houston, Texas 77040, 713-929-3325.
(4) For each ESV transmitter, a record of the ship location (*i.e.,* latitude/longitude), transmit frequency, channel bandwidth and satellite used shall be time annotated and maintained for a period of not less than 1 year. Records will be recorded at time intervals no greater than every 20 minutes while the ESV is transmitting. The ESV operator will make this data available upon request to a coordinator, fixed system operator, fixed-satellite system operator, NTIA, or the Commission within 24 hours of the request.	ESV data will be stored at the Network Operations Center, 15110 Northwest Freeway, Suite 120, Houston, Texas 77040.
(5) ESV operators communicating with vessels of foreign registry must maintain detailed information on each vessel's country of registry and a point of contact for the relevant administration responsible for licensing ESVs.	The Network Operations Center, 15110 Northwest Freeway, Suite 120, Houston, Texas 77040, will maintain all vessel records.
(6) ESV operators shall control all ESVs by a hub earth station located in the United States.	All ESV remote stations will be controlled both by the Network Operations Center in Houston, Texas, and the hub station in Napa, California.
(7) In the 10.95-11.2 GHz (space-to-Earth) and 11.45-11.7 GHz (space-to-Earth) frequency bands ESVs shall not claim protection from interference from any authorized terrestrial stations to which frequencies are either already assigned, or may be assigned in the future.	Blue Marble will claim no protection when operating in the extended Ku-bands.
(b) Application Requirements	
(1) An ESV applicant proposing to implement a transmitter under paragraph (a)(1) must provide certain certifications and demonstrations as exhibits to its earth station application.	The certifications are provided in the FCC Form 312 and the exhibits.
Antenna Data - (i) Any ESV applicant must file three tables showing the off-axis EIRP level of the proposed earth station antenna in the direction of the plane of the GSO; the co-polarized EIRP in the elevation plane, that is, the plane perpendicular to the plane of the GSO; and cross polarized EIRP. In each table, the EIRP level must be provided at increments of 0.1° for angles between 0° and 10° off-axis, and	Exhibit C, EIRP Density Tables, demonstrates how Blue Marble meets this requirement.

FCC Section 25.222 Requirement	Compliance
at increments of 5° for angles between 10° and 180° off-axis. (A) For purposes of the off-axis EIRP table in the plane of the GSO, the off-axis angle is the angle in degrees from the line connecting the focal point of the antenna to the orbital location of the target satellite, and the plane of the GSO is determined by the focal point of the antenna and the line tangent to the arc of the GSO at the orbital position of the target satellite. (B) For purposes of the off-axis co-polarized EIRP table in the elevation plane, the off-axis angle is the angle in degrees from the line connecting the focal point of the antenna to the orbital location of the target satellite, and the elevation plane is defined as the plane perpendicular to the plane of the GSO defined in paragraph (b)(1)(i)(A) of this section. (C) For purposes of the cross-polarized EIRP table, the off-axis angle is the angle in degrees from the line connecting the focal point of the antenna to the orbital location of the target satellite and the plane of the GSO as defined in paragraph (b)(1)(i)(A) of this section will be used.	
(ii) A certification, in Schedule B, that the ESV antenna conforms to the gain pattern criteria of § 25.209(a) and (b), that, combined with the maximum input power density calculated from the EIRP density less the antenna gain, which is entered in Schedule B, demonstrates that the off-axis EIRP spectral density envelope set forth in paragraphs (a)(1)(i)(A) through (a)(1)(i)(C) of this section will be met under the assumption that the antenna is pointed at the target satellite.	FCC Form 312, Schedule B, Question E15 provides this certification.
(iii) An ESV applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(A) of this section, must provide a certification from the equipment manufacturer stating that the antenna tracking system will maintain a pointing error of less than or equal to 0.2º between the orbital location of the target satellite and the axis of the main lobe of the ESV antenna and that the antenna tracking system is capable of ceasing emissions within 100 milliseconds if the angle between the orbital location of the target satellite and the axis of the main lobe of the ESV antenna exceeds 0.5°.	Exhibit B, Declaration of Peter Blaney, Chief Engineer of Cobham SATCOM, Sea Tel, Inc. verifies compliance with this requirement.
(iv) An ESV applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(B) of this section must provide certain data.	Not applicable. Blue Marble complies with paragraph (a)(1)(ii)(a).
(2) An ESV applicant proposing to implement a transmitter under paragraph (a)(2) of this section and using off-axis EIRP spectral-densities in excess of the levels in paragraph (a)(1)(i) of this section must provide certain certifications and demonstrations as exhibits to its earth station application.	Not applicable. Blue Marble does not propose to use a transmitter under paragraph (a)(2).
(3) There shall be an exhibit included with the application describing the geographic area(s) in which the ESVs will operate.	Exhibit E, ESV Operating Regions.
(4) The point of contact referred to in paragraph (a)(3) and, if applicable paragraph (a)(6) of this section, must be included in	Peter Malcolm is the point of contact for both (a)(3) and (a)(6). His point

FCC Section 25.222 Requirement	Compliance
the application.	of contact is provided in this table and in FCC Form 312, Schedule B.
(5) ESVs that exceed the radiation guidelines of Section 1.1310 Radiofrequency radiation exposure limits must provide, with their environmental assessment, a plan for mitigation of radiation exposure to the extent required to meet those guidelines.	Exhibit A demonstrates Blue Marble's with the radiation guidelines.
(c) Operations of ESVs in the 14.0-14.2 GHz (Earth-to-space) frequency band within 125 km of the NASA TDRSS facilities on Guam (located at latitude: 13° 36' 55" N, longitude 144° 51' 22" E) or White Sands, New Mexico (latitude: 32° 20' 59" N, longitude 106° 36' 31" W and latitude: 32° 32' 40" N, longitude 106° 36' 48"W) are subject to coordination through the National Telecommunications and Information Administration (NTIA) Interdepartment Radio Advisory Committee (IRAC). When NTIA seeks to provide similar protection to future TDRSS sites that have been coordinated through the IRAC Frequency Assignment Subcommittee process, NTIA will notify the Commission that the site is nearing operational status. Upon public notice from the Commission, all Ku-band ESV operators must cease operations in the 14.0-14.2 GHz band within 125 km of the new TDRSS site until after NTIA/IRAC coordination for the new TDRSS facility is complete. ESV operations will then again be permitted to operate in the 14.0-14.2 GHz band within 125 km of the new TDRSS site, subject to any operational constraints developed in the coordination process.	Blue Marble will not operate within 125 km of the NASA TDRSS facilities on Guam unless and until it has completed coordination through IRAC. White Sands, New Mexico is more than 125 km outside of Blue Marble's proposed area of operations.
(d) Operations of ESVs in the 14.47-14.5 GHz (Earth-to-space) frequency band within 45 km of the radio observatory on St. Croix, Virgin Islands (latitude 17° 46' N, longitude 64° 35' W); 125 km of the radio observatory on Mauna Kea, Hawaii (at latitude 19° 48' N, longitude 155° 28' W); and 90 km of the Arecibo Observatory on Puerto Rico (latitude 18° 20' 46" W, longitude 66° 45' 11" N) are subject to coordination through the National Telecommunications and Information Administration (NTIA) Interdepartment Radio Advisory Committee (IRAC).	To the extent Blue Marble will not operate within 125 km of the Mauna Kea radio observatory unless and until it has completed coordination through IRAC. The Virgin Islands and Puerto Rico are more than 125 km outside of Blue Marble's proposed area of operations.

In addition to the Form 312 and this narrative, the attached exhibits demonstrate that Blue Marble's proposed ESV system will comply with the Commission's rules and, in particular, the requirements of 47 C.F.R. § 25.222. These exhibits are:

Exhibit A – Radiation Hazard Analysis
Exhibit B – Declaration of Peter Blaney, Chief Engineer of Cobham SATCOM, Sea Tel, Inc.
Exhibit C – EIRP Density Tables
Exhibit D – Antenna Patterns
Exhibit E – ESV Operating Regions

Exhibit F – Operating Frequencies

III. WAIVER REQUEST

Blue Marble requests a waiver of Section 25.202(a)(8) and, to the extent necessary, Section 2.106 of the Commission's Rules (Footnote NG182 of the U.S. Table of Frequency Allocations) to permit ESV downlink operations in the 12.2-12.75 GHz frequency band for operations outside the United States. While the *ESV Order* contemplates possible use of extended Ku-band frequencies for ESV operations, it did not provide for use of some other Ku-band FSS downlink frequencies allocated outside of Region 2.[2] The 12.2-12.75 GHz band is a standard FSS band in Region 3.[3]

Blue Marble seeks to communicate with the GE-23 satellite in the 12.2-12.75 GHz band. The GE-23 satellite has coverage areas in Asia that are in ITU Region 3 where the conventional U.S. Ku-band downlinks are generally not available for use, and the requested frequencies are consistent with the FSS downlink allocations for ITU Region 3. Inclusion of additional Ku-band downlink frequencies is necessary to provide seamless coverage to major maritime routes between North America and Asia, permitting continuous ESV service to customers on a global basis.

Grant of the requested waiver is consistent with Commission rules governing rule waivers because it will not increase the potential for interference to authorized users of the

[2] *See* Procedures to govern the Use of Satellite Earth Stations on Board Vessels in the 5925-6425 MHz/3700-4200 MHz Bands and 14.0-14.5 GHz/11.7-12.2 GHz Bands, *Report and Order*, 20 FCC Rcd. 674, 710-11 ¶¶ 85-86 (2005) ("*ESV Order*").

[3] *See* 47 C.F.R. § 2.106 and International Footnote 5.149.

spectrum or otherwise undermine the purpose of the rule.[4] Blue Marble will use these frequencies outside the United States consistent with the coordinated parameters of the serving satellites and other relevant requirements, so there is no possibility of harmful interference to other spectrum users in the band. Furthermore, because the rule identifying spectrum permissible for use by ESVs contemplates spectrum allocated in the United States and Region 2 only, a waiver of the provision to permit ESV downlink operations in other regions would not undermine the purpose of the rule. The use of the additional extended Ku-band frequency band by Blue Marble will result in important public benefits and would have no adverse impact on other users of the spectrum or undermine the purpose of the rule. Therefore, grant of the requested waiver would serve the public interest.

[4] *See* 47 C.F.R. § 1.3; *see also ICO Global Communications (Holdings) Limited v. FCC*, 428 F.3d 264 (2005); *Northeast Cellular Telephone Co. v. FCC*, 897 F.2d 1164 (D.C. Cir 1990); *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969).

IV. CONCLUSION

Because the operation of this proposed ESV network will serve the public interest and comply with all applicable rules and regulations, Blue Marble respectfully requests the grant of its application for authority as amended by this amendment to operate a network of ESV stations.

Respectfully submitted,

Blue Marble Network LLC

/s/

Alfred Mamlet
Christopher R. Bjornson
Steptoe & Johnson LLP
1330 Connecticut Avenue, N.W.
Washington, D.C. 20036
(202) 429-3000
Counsel for Blue Marble Network, LLC

October 18, 2010