

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

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In the Matter of )  
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**Equant, Inc.** ) File No. SES-LIC-2011 \_\_\_\_ - \_\_\_\_  
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Application for the Authority to Operate a ) Call Sign \_\_\_\_\_  
Network of Earth Stations onboard Vessels )  
In the Ku-band )  
\_\_\_\_\_ )

**APPLICATION FOR AUTHORITY**

Equant, Inc., (“Equant”), through this 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 10.95-12.75 GHz and 14.0-14.5 GHz (“Ku-band”) frequency bands to communicate with an already authorized network hub station located in Manassas, Virginia. The network will deliver voice and data service.

**I. DESCRIPTION OF NETWORK AND SCOPE OF OPERATIONS**

Through the development of its ESV network, Equant will be able to serve customers that include off-shore petroleum installations and transoceanic shippers delivering cargo foreign owned facilities and flagged-vessels.

The data and voice services that Equant will provide will permit its customers to supplement and improve their existing communications systems affording improvement

to their operations, as well as providing their employees or crew members an improved and more effective means for offshore communications.

As permitted by the Commission's rules, Equant seeks ALSAT authority for its ESV network. Equant will offer Ku-band services using the NSS-7 satellite located at 22° W.L. and the T-11N satellite located at 37.5° W.L. The network will use an iDirect Network Management System that will operate and control the ESV network as it operates on board customer vessels and facilities in the off-shore waters of the east coast of the United States, the Gulf of Mexico, Brazil and the Atlantic Ocean.

Equant will use the VSAT network hub antennas previously licensed by the FCC under the registration number E020071. The hub station consists of one 13 meters fixed earth stations located at Manassas, Virginia. Network access, control and maintenance is controlled and managed 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 the activity, including registrations, bandwidth allocations, and bandwidth increases are recorded and logged at the NOC. The network hub will also monitor every ESV remote terminal for terminal status, location, satellite in use and frequency in use. All this information will be stored on a server at the NOC as well as on a network management system ("NMS") at the hub station. All such information will be available, as required by the Commission's rules, to the FCC or an FSS space station operator within twenty-four hours of being requested.

Equant’s network remote antennas are the Sea Tel Models 4006 and 4009. Both models have 1.0 meter antennas. Also, both models provide stabilized tracking as the antenna communicates with the Ku-band satellite. The main lobes of the antennas meet the standards specified in Sections 25.209 (a-b) of the Commission’s rules. **Exhibit D** demonstrates how Equant’s ESV network’s transmit power will meet the Commission’s off-axis EIRP requirements for its hub facility. **Exhibit E** provides the antenna patterns and off-axis emissions that meet the FCC’s ESV off-axis spectral density requirements.

Equant’s customers, when operating an ESV in international waters will operate in accordance with Commission’s procedures concerning FCC-licensed ESV’s operating in international waters and near the coasts of other countries.

## **II. COMPLIANCE WITH THE COMMISSION’S ESV RULES**

The table below details how Equant meets each of the FCC’s ESV requirements by either stating how Equant will comply or references an exhibit that demonstrates compliance.

### **Section 25.222 Requirements**

<b>FCC Section 25.222</b>	<b>Compliance</b>
(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 paragraph(a)(3)-(a)(7) of this section.	Equant chooses to comply with the requirements of (a)(1).
(1) The following requirements shall apply to an ESV that uses transmitters with off-axis EIRP spectral densities lower than or equal to the level in paragraph (A) of this subsection.	Equant will use transmitters that comply with this section.
(i) An ESV system shall not exceed the off-axis EIRP spectral density limits and the conditions defined in paragraph (A)-(D) of this subsection.	Equant will comply with the conditions and limits as described below.

FCC Section 25.222	Compliance
<p>(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: <math>15 - 10\log(N) - 25\log\theta</math> dBW/4 kHz for <math>1.5^\circ \leq \theta \leq 7^\circ</math>  <math>-6 - 10\log(N)</math>dBW/kHz for <math>7^\circ &lt; \theta \leq 9.2^\circ</math>  <math>18 - 10\log(N) - 25\log\theta</math> dBW/4 kHz for <math>9.2^\circ &lt; \theta \leq 48^\circ</math>  <math>-24 - 10\log(N)</math> dBW/4 kHz for <math>48^\circ &lt; \theta \leq 85^\circ</math>  <math>-14 - 10\log(N)</math> dBW/4 kHz for <math>85^\circ &lt; \theta \leq 180^\circ</math></p>	<p>Exhibit C, EIRP Density Tables, demonstrate how Equant meets the requirements.</p>
<p>(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:  <math>18 - 10\log(N) - 25\log\theta</math> dBW/4 kHz for <math>3.0^\circ \leq \theta \leq 48^\circ</math>  <math>-24 - 10\log(N)</math> dBW/4 kHz for <math>48^\circ &lt; \theta \leq 85^\circ</math>  <math>-14 - 10\log(N)</math> dBW/4 kHz for <math>85^\circ &lt; \theta \leq 180^\circ</math></p>	<p>Exhibit D, Antenna Patterns, demonstrates how Equant meets this requirement.</p>
<p>(C) In all directions, the off-axis EIRP spectral-density for cross-polarized signals emitted from the ESV shall not exceed the following values:  <math>5 - 10\log(N) - 25\log\theta</math> dBW/4 kHz for <math>1.8^\circ \leq \theta \leq 7.0^\circ</math>  <math>-16 - 10\log(N)</math> dBW/4 kHz for <math>7.0^\circ &lt; \theta \leq 9.2^\circ</math></p>	<p>Exhibit D, Antenna Patterns, demonstrates how Equant meets this requirement.</p>
<p>(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.</p>	<p>Equant's system does not include non-circular ESVs.</p>
<p>(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 <math>0.2^\circ</math> 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 <math>0.2^\circ</math> provided that the ESV does not exceed the off-axis EIRP spectral-density limits in paragraph (a)(1)(i) of this section.</p>	<p>Exhibit B, Declaration of Peter Blaney, Chief Engineer of Cobham SATCOM, Sea Tel, Inc., demonstrates compliance with subsection A of this requirement.</p>

<b>FCC Section 25.222</b>	<b>Compliance</b>
<p>(iii) Each ESV transmitter must meet one of the following cessation of emission requirement:  (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's antenna exceeds 0.5°, and the 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 between the main lobe of the ESV antenna exceeds the declared maximum antenna pointing error.</p>	<p>Exhibit B, Declaration of Peter Blaney, Chief Engineer of Cobham, SATCOM, Sea Tel Inc., demonstrates compliance with subsection A of this requirement.</p>
<p>(2) Requirments applicable to an ESV that uses off-axis spectral-densities in excess of the levels in paragraph (a)(1)(i) of this section.</p>	<p>This section does not apply to Equant, as its system does not use off-axis EIRP spectral-densities in excess of the levels in paragraph (a)(1)(i).</p>
<p>(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.</p>	<p>NOC/Washington Media Port 8000  Gainsford Ct., Bristow, VA. 20136  Tel: 703-330-3305  Fax: 703-330-3302  Email: noc@sesnewskies.com</p>
<p>(4) For each ESV transmitter, a record of the ship location (<i>i.e.</i>, latitude and 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-satellite system operator, NTIA, or the Commission within 24 hours of the request.</p>	<p>ESV data will be stored at the NOC Washington Media Port 8000  Gainsford Ct., Bristow, VA. 20136  Tel: 703-330-3305  Fax: 703-330-3302  Email: noc@sesnewskies.com</p>
<p>(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.</p>	<p>This data will be kept by Ivana Kriznic, 13775 McLearen Road, Oak City, VA, 20171</p>

<b>FCC Section 25.222</b>	<b>Compliance</b>
(6) ESV operators shall control all ESVs by a hub station located in the United States.	All ESV remote stations will be controlled by the NOC located in Washington Media Port 8000 Gainsford Ct., Bristow, VA. 20136 and the hub station in Manassas.
(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 the frequencies are either already assigned, or may be assigned in the future.	Equant shall claim no protection when operating in the extended Ku-bands.
<b>(b) Application Requirements</b>	
(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.
<p>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 the cross polarized EIRP. In each table, the EIRP level must be provided at the increments of 0.1° for the angles between 0° and 10° degrees off-axis, and at increments of 5° for angles between 10° off-axis and 180° off-axis.</p> <p>(A) for purposes of the off-axis EIRP table in the plane of the if 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.</p> <p>(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.</p> <p>(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</p>	Exhibit C, EIRP Density Tables, demonstrates how Equant meets this requirement.

<b>FCC Section 25.222</b>	<b>Compliance</b>
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 E-15 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 0.2° 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. Equant complies with paragraph (a)(1)(ii)(A)
(2) An ESV applicant proposing to implement an 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 the exhibits to its earth station application.	Not applicable. Equant 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.

<b>FCC Section 25.222</b>	<b>Compliance</b>
<p>(4) The point of contact referred to in paragraph (a)(3) and, if applicable paragraph (a)(6) of this section, must be included in the application.</p> <p>(a)(3) There shall be a point of contact in the United States, with phone number and address, available 24 hours a day, seven days a week, with authority and ability to cease all emissions from the ESVs, either directly or through the facilities of a U.S. Hub or a Hub located in another country with which the United States has a bilateral agreement that enables such cessation of emissions.</p> <p>(a)(6) ESV operators shall control all ESVs by a Hub earth station located in the United States, except that an ESV on U.S.-registered vessels may operate under control of a Hub earth station location outside the United States provided the ESV operator maintains a point of contact within the United States that will have the capability and authority to cause an ESV on a U.S.-registered vessel to cease transmitting if necessary</p>	<p>His point of contact is provided in this table and in FCC Form 312, Schedule B.</p> <p>NOC/Washington Media Port 8000 Gainsford Ct., Bristow, VA. 20136 Tel: 703-330-3305 Fax: 703-330-3302 Email: noc@sesnewskies.com</p>
<p>(5) ESVs that exceed the radiation guidelines of Section 1.1310 Radiofrequency radiation exposure limits must provide, with their environment assessment, a plan for mitigation of radiation exposure to the extent required to meet those guidelines.</p>	<p>Exhibit A demonstrates Equant's compliance with the radiation guidelines.</p>
<p>(c) Operations of ESVs in the 14.0-14.2 GHz (Earth-to-space) frequency band within 125km 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° 20' 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.</p>	<p>This requirement is not applicable to Equant as its operations do not come within the specified locations. Exhibit E details Equant's proposed area of operations.</p>



<b>FCC Section 25.222</b>	<b>Compliance</b>
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 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.	
(d) Operations of ESVs in the 14.47-14.5 GHz (Earth-to-space) frequency band within 45km 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 (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 that Equant operates within 45km of the St. Croix radio observatory and 90 km of the Arecibo Observatory, it will coordinate through IRAC.

In addition to the Form 312 and this narrative, the attached exhibits demonstrate that Equant’s proposed ESV system will comply with Commission’s rules and particularly the requirement 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. CONCLUSION

Because the operation of this proposed ESV network will serve the public interest and comply with all applicable rules and regulation, Equant respectfully requests the grant of its application for the authority to operate a network of ESV stations.

Respectfully submitted,

**Equant, Inc.**

\_\_\_\_\_/s/\_\_\_\_\_  
Ivana Kriznic  
13775 McLearen Road  
Oak Hill, VA 20171

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