

**ISAT US Inc.**  
**FCC Form 312**  
**Exhibit E**  
**Response to Question 43**

ISAT US Inc. (“ISAT US”) seeks to modify its existing blanket authority to operate mobile earth terminals (“METs”) in the United States to access satellites on the ISAT List.<sup>1</sup> More specifically, ISAT US seeks to cover a new configuration of the Inmarsat IsatPhone Pro (“IsatPhone”), which already is licensed. As discussed below, this new IsatPhone configuration complies with all applicable Commission technical requirements.

**A. IsatPhone with Vehicular Docking Station**

The IsatPhone is the first handset to be purpose-built for the Inmarsat network, and is the first product in Inmarsat’s family of Global Satellite Phone Services (“GSPS”). GSPS is a highly competitive offering in terms of hardware costs, airtime rates, and service quality, with a strong combination of form and functionality that Inmarsat believes will change the landscape in the provision of the mobile satellite services. GSPS is available on a global basis over Inmarsat-4 satellites.

The IsatPhone has been optimized to deliver the best performance over Inmarsat’s advanced mobile satellite network, and supports satellite telephony, including circuit-switched voice, SMS, fax, data, and supplementary services. The IsatPhone also supports voicemail, text and email messaging and Bluetooth devices for hands-free use. Location data also is available to the user to look up or send in a text message. The Commission already has licensed ISAT US to provide service using IsatPhone terminals. *See* IBFS File No. SES-MOD-20100323-00357.

The new configuration of the IsatPhone described herein would allow a user to “dock” the IsatPhone in a docking station with an external amplified antenna that is designed for use in land based applications (*e.g.*, on motor vehicles). This antenna has enhanced performance compared with the IsatPhone’s built-in antenna. That built-in antenna would cease operation while the IsatPhone is “docked”. Because this new configuration would operate with technical parameters differing from those of the “undocked” IsatPhone, ISAT US is treating this new configuration as a separate antenna type.

**B. Radiation Hazard Studies**

Authorization to market the “docked” configuration of the IsatPhone in the United States already has been obtained, consistent with the requirements of Part 2 of the Commission’s rules.<sup>2</sup> Portions of the test report prepared in connection with that process address radiation hazard issues, and are appended hereto. As indicated therein, installers will be provided with detailed instructions to ensure that equipment does not pose a radiation hazard. Among other things, installers and customers will be directed to ensure a minimum separation distance of 55 centimeters between the external antenna and any human body. A warning label containing this information also will be affixed to the antenna.

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<sup>1</sup> *See* IBFS File No. SES-LIC-20090217-00184 (Call Sign E090032).

<sup>2</sup> *See* Certification of Beam Communications Pty Ltd, FCCID YP9AT1595 (granted Oct. 15, 2010).

### **C. Compliance with Out of Band and Spurious Emissions Lists**

The level of out-of-band and spurious emissions from the “docked” configuration of the IsatPhone conforms to the Commission’s rules.<sup>3</sup> Specifically, in order to receive Inmarsat type approval, the “docked” configuration of the IsatPhone has been designed to operate in conformance with Inmarsat’s established standards, which include limitations on out-of-band and spurious emissions that are designed to meet, at a minimum, the Commission’s specifications.

### **D. Compliance with GMDSS and AMS(R)S Priority and Preemption Requirements**

The application for the existing license for Call Sign E090032 demonstrated that ISAT US’s authorized operations would comply with the Commission’s requirements for ensuring the priority and real-time preemption necessary to protect the GMDSS and AMS(R)S.<sup>4</sup> That showing was accepted by the Commission in licensing the IsatPhone, and remains equally applicable to the “docked” configuration of the IsatPhone. Specifically, through frequency management, operations of the “docked” configuration of the IsatPhone will comply with these requirements in the same manner.

### **E. Type Certification**

The Commission has adopted rules and policies pertaining to portable Global Mobile Personal Communications by Satellite (“GMPCS”) transceivers, which are satellite telephones and other portable transceivers operated by end users for communication by satellites.<sup>5</sup> In particular, the Commission requires “portable” GMPCS transceivers imported, sold, leased, shipped, or distributed after November 19, 2004 to be certified pursuant to the Commission’s equipment certification procedures. As discussed above, Inmarsat is in the process of completing the Part 2 certification process for the “docked” configuration of the IsatPhone, and hope to have that process completed in October 2010.

### **F. Request to Adopt Condition**

Pursuant to the provisions of the agreement between Inmarsat on the one hand and the U.S. Department of Justice and the Department of Homeland Security on the other, dated September 23, 2008, as amended (the “Agreement”), any FCC authorizations granted to Inmarsat must be conditioned on compliance with the terms of the Agreement. The existing license for Call Sign E090032 contains the following condition:

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<sup>3</sup> See 47 C.F.R. §§ 25.202(f), 25.216.

<sup>4</sup> See IBFS File No. SES-LIC-20090217-00184 at Exh. E. See also 47 C.F.R. § 2.106, n.US315; 47 C.F.R. § 25.136(d) (GMDSS); 47 C.F.R. § 2.106 n.US308; *In re Application of AMSC Subsidiary Corporation*, 10 FCC Rcd 9507, 9511 (IB 1995) (AMS(R)S).

<sup>5</sup> See *Amendment of Parts 2 and 25 to Implement the Global Mobile Personal Communications by Satellite (GMPCS) Memorandum of Understanding and Arrangements*, Second Report and Order, 18 FCC Rcd 24423 (2003) (“GMPCS Order”).

This authorization and any licenses related thereto are subject to compliance with the provisions of the Agreement between Inmarsat on the one hand and the U.S. Department of Justice (DOJ) and the Department of Homeland Security (DHS) on the other, dated September 23, 2008.

ISAT US requests that the Commission continue this condition in any modified license.

**G. Public Interest Showing**

Grant of this application would provide ISAT US the necessary flexibility to offer mobile satellite service (“MSS”) to, from and within the U.S. with handheld terminals in both “docked” and “undocked” configuration. This would facilitate more robust competition with other MSS providers. Further, grant of this application would speed the provision of service to end users by allowing existing and new distribution partners to provide Inmarsat service under the aegis of ISAT US’s license without the delay associated with obtaining duplicative licenses.<sup>6</sup> Accordingly, grant of this application is in the public interest.

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For the foregoing reasons, ISAT US respectfully requests that this application be granted.

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<sup>6</sup> See 47 C.F.R. § 25.136(c). Some of ISAT US’s distribution partners may seek their own licenses.

## 5.2. RF EXPOSURE REQUIRMENTS [§1.1310 & 2.1091]

The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation.

### FCC 47 CFR § 1.1310:

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

| Frequency range (MHz)  | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm <sup>2</sup> ) | Averaging time (minutes) |
|--|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| <b>(A) Limits for Occupational/Controlled Exposures</b>        |                               |                               |                                     |                          |
| 0.3–3.0 .....  | 614                           | 1.63                          | *(100)                              | 6                        |
| 3.0–30 .....   | 1842/f                        | 4.89/f                        | *(900/f <sup>2</sup> )              | 6                        |
| 30–300 .....   | 61.4                          | 0.163                         | 1.0                                 | 6                        |
| 300–1500 .....   | .....                         | .....                         | f/300                               | 6                        |
| 1500–100,000 .....   | .....                         | .....                         | 5                                   | 6                        |
| <b>(B) Limits for General Population/Uncontrolled Exposure</b> |                               |                               |                                     |                          |
| 0.3–1.34 .....   | 614                           | 1.63                          | *(100)                              | 30                       |
| 1.34–30 .....  | 824/f                         | 2.19/f                        | *(180/f <sup>2</sup> )              | 30                       |
| 30–300 .....   | 27.5                          | 0.073                         | 0.2                                 | 30                       |
| 300–1500 .....   | .....                         | .....                         | f/1500                              | 30                       |
| 1500–100,000 .....   | .....                         | .....                         | 1.0                                 | 30                       |

f = frequency in MHz

\* = Plane-wave equivalent power density

NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

### 5.2.1. Method of Measurements

Refer to Sections 1.1310, 2.1091

In order to demonstrate compliance with MPE requirements (see Section 2.1091), the following information is typically needed:

- (1) Calculation that estimates the minimum separation distance (20 cm or more) between an antenna and persons required to satisfy power density limits defined for free space.
- (2) Antenna installation and device operating instructions for installers (professional/unskilled users), and the parties responsible for ensuring compliance with the RF exposure requirement
- (3) Any caution statements and/or warning labels that are necessary in order to comply with the exposure limits
- (4) Any other RF exposure related issues that may affect MPE compliance

**Calculation Method of RF Safety Distance:**

$$S = PG/4\pi r^2 = EIRP/4\pi r^2$$

Where: P: power input to the antenna in mW  
 EIRP: Equivalent (effective) isotropic radiated power  
 S: power density mW/cm<sup>2</sup>  
 G: numeric gain of antenna relative to isotropic radiator  
 r: distance to centre of radiation in cm

$$r = \sqrt{EIRP/4\pi S}$$

**5.2.2. RF Evaluation**

| Evaluation of RF Exposure Compliance Requirements  |   |
|--|---|
| RF Exposure Requirements   | Compliance with FCC Rules   |
| Minimum calculated separation distance between antenna and persons required: 42.2 cm   | Manufacturer’ instruction for separation distance between antenna and persons required: 55 cm.  |
| Antenna installation and device operating instructions for installers (professional/unskilled users), and the parties responsible for ensuring compliance with the RF exposure requirement | Antenna installation and device operating instructions shall be provided to installers to maintain and ensure compliance with RF exposure requirements. |
| Caution statements and/or warning labels that are necessary in order to comply with the exposure limits  | Refer to User’s Manual for RF Exposure Information.   |
| Any other RF exposure related issues that may affect MPE compliance  | None.   |

\*The minimum separation distance between the antenna and bodies of users are calculated using the following formula:

RF EXPOSURE DISTANCE LIMITS:  $r = (PG/4\pi S)^{1/2} = (EIRP/4\pi S)^{1/2}$

S = 1.0 mW/cm<sup>2</sup>  
 Antenna Gain = 6 dBi  
 Maximum Conducted Power = 37.5 dBm  
 Maximum EIRP = 37.5 dBm + 6 dBi = 43.5 dBm = 22387.21 mWatts

$$r = (EIRP/4\pi S)^{1/2} = (22387.21 / (4\pi * 1.0))^{1/2} = 42.2 \text{ cm}$$

for r = 1m , EIRP = 22.4 Watts

$$S = PG/4\pi r^2 = EIRP/4\pi r^2 = 1.78 \text{ W/m}^2$$

Model AT1595-83 (Drive/Lite)



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- All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)