TRAI IFC Consultation

ViaSat Inc. is a global communications and technology company. As a global broadband services provider, ViaSat Inc. connects international communities and offers residential internet service; enables streaming of high-bandwidth applications and content on commercial, business and government aircraft and watercraft; and delivers and protects information when and where it is needed most with our trusted communications ground systems, infrastructure, and services.

ViaSat appreciates the opportunity provided by the TRAI to give its views on the In Flight Connectivity Services in India.

INTRODUCTION

ViaSat's Revolutionary Use of the Ka band

The constant increase in demand for more high-speed internet is undeniable. Worldwide use of bandwidth is doubling every two or three years. ViaSat high-capacity satellite systems are tailor-made to keep up with this increasing demand while improving connection speeds and making available more bandwidth to meet the demand of each customer of the network.

While the first version of satellite broadband services in the Ka band supported speeds that did not exceed 1.5 Mbit/s, today's offerings are far more robust and bandwidth intensive. Specifically, ViaSat currently offers 25/3 Mbit/s speeds, and soon will be offering even higher speeds throughout its service footprint—following the launch of ViaSat-2 on June 1, 2017 and the expected launch of ViaSat-3 in 2019. ViaSat-2 will support peak speeds of 100-plus Mbit/s when it enters service later this year. Each of the 3 planned ViaSat-3 satellites will have over one terabit per second (1,000 Gbit/s) of capacity, allowing them to provide 100 Mbit/s connectivity to end users and burst speeds in the 1 Gbit/s range.

Moreover, ground-breaking satellite broadband technology developed in the past two decades makes it possible for consumers to enjoy high-speed broadband connections on board commercial airlines, and to stream services such as Netflix and Amazon Video while in flight. ViaSat is currently providing in-flight broadband connectivity to over 1,100 aircraft today, including 568 commercial aircraft and many hundreds of business and government aircraft. Commercial airlines we work with include United Airlines, JetBlue, American Airlines, Qantas, El Al, Finn Air, SAS, and IcelandAir. In total, three million plus personal electronic devices connect each month though these ViaSat satellite broadband connections from commercial airlines. In the near future, an additional 840 planes from various airlines will be connected to the ViaSat IFC network.

Q.1 Which of the following IFC services be permitted in India?
a. Internet services
b. Mobile Communication services (MCA service)
c. Both, Internet and MCA

ViaSat supports permitting both Internet and MCA services in India. Our experience in the IFC market confirms the trend noted in this consultation document that there is a tremendous demand among passengers for IFC services to computers and personal devices. As India is an

extremely important origin/destination for international travelers and also lies along the key Europe-Asia flight path, it is critical for the continued growth of the IFC market for India to permit these services in Indian airspace. Allowing MCA and IFC services will also promote growth of the Indian aviation sector, which is an important contributor to growth of the Indian economy.

While the consultation focuses mainly on commercial airline usage of IFC, ViaSat wishes to point out that private business aircraft are also served by IFC systems. The ITU and CEPT rules referred by the TRAI apply equally to these types of aircraft. ViaSat proposes that the rules eventually adopted by the TRAI pursuant to this consultation also allow IFC services on board business jets and executive transport aircraft.

Q.2 Should the global standards of AES/ESIM, shown in Table 2.1, be mandated for the provision of AMSS in Indian airspace?

ViaSat fully supports mandating the standards in Table 2.1 for the provision of IFC services in India with one qualification. The ECC Decisions contained in Table 2.1 contain restrictions on maximum EIRP and operations of ESIMs in the vicinity of airports. These limitations are based on a Report which has since been approved for withdrawal and replacement. Thus, we expect these ECC Decisions (esp. ECC/DEC(05)11 and ECC/DEC(13)01) to be amended in 2018 to reflect the new maximum EIRP and gate to gate operational rules contained in draft new ECC Report 272. Please see the discussion in response to Question 4 for further information.

Q.3 If MCA services are permitted in Indian airspace, what measures should be adopted to prevent an airborne mobile phone from interfering with terrestrial cellular mobile network? Should it be made technology and frequency neutral or restricted to GSM services in the 1800 MHz frequency band, UMTS in the 2100 MHz band and LTE in the 1800 MHz band in line with EU regulations?

Q.4 Do you foresee any challenges, if the internet services be made available 'gate to gate' i.e. from the boarding gate of the departure airport until the disembarking gate at the arrival airport?

The issue of Gate to Gate operations has been studied intensively for the past 2 years within the CEPT. This issue had previously been the subject of an ECC Report dating from 2005 which established suggested coordination areas at airports in order to protect aircraft from High Intensity Field Radiation (HIRF).[1] Upon consultation with the European Aviation Safety Authority (EASA), the CEPT determined that the HIRF protection criteria used in the 2005

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[1] See ECC Report 066, available at: http://www.erodocdb.dk/Docs/doc98/official/pdf/ECCREP066.PDF

Report (20 V/m) was not correct. The CEPT group responsible for this Report recently approved a complete revision of the 2005 at its September 2017 meeting.[2]

Thus, after public consultation is completed in December 2017, Report 066 will be withdrawn and replaced by draft Report 272.[3] This draft new Report recommends that no restrictions be placed on the operation of aircraft earth stations operating on the ground at airports so long as their transmit power falls below the following levels for the relevant bands:

4-6 GHz	12-18 GHz	18-40 GHz
59.0 dBW	60.5 dBW	58.4 dBW

The draft Report 272 also allows ESIM operators using TDMA transmissions to take into account the Aircraft Earth Station's duty cycle in assessing compliance with these EIRP limits.

ViaSat recommends that the TRAI adopt the guidance contained in the Draft Report 272 in setting these limits.

Q.5 Whether the Unified Licensee having authorization for Access Service/Internet Service (Cat-A) be permitted to provide IFC services in Indian airspace in airlines registered in India?

Q.6 Whether a separate category of IFC Service Provider be created to permit IFC services in Indian airspace in airlines registered in India?

Q.7 Whether an IFC service provider be permitted to provide IFC services, after entering into an agreement with Unified Licensee having appropriate authorization, in Indian airspace in airlines registered in India?

Yes, ViaSat recommends that TRAI permit this.

Q.8 If response to Q.7 is YES, is there any need for separate permission to be taken by IFC service providers from DoT to offer IFC service in Indian airspace in Indian registered airlines? Should they be required to register with DoT? In such a scenario, what should be the broad requirements for the fulfillment of registration process?

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[2] See Minutes of the 77th WGSE meeting, available under https://cept.org/Documents/wg-se/38915/se-17-097_minutes-of-the-77th-wgse-meeting. A copy of Draft ECC Report 272 is available at: https://cept.org/Documents/wg-se/38699/se-17-097a09_draft-ecc-report-272

[3] The CEPT notes that Report 066 will be withdrawn and replaced by draft Report 272 in a note on the cover page of Report 066.

In the case of an IFC provider entering into an agreement with a Unified Licensee, to provide services to Indian registered airlines in Indian airspace, ViaSat recommends that separate registration of IFC providers if required, be done with a light touch using a simple online process. See also response to Q.11.

Q.9 If an IFC service provider be permitted to provide IFC services in agreement with Unified Licensee having appropriate authorization in airlines registered in India, which authorization holder can be permitted to tie up with an IFC service provider to offer IFC service in Indian airspace?

Q.10 What other restrictions/regulations should be in place for the provision of IFC in the airlines registered in India.

Q.11 What restrictions/regulations should be in place for the provision of IFC in the foreign airlines? Should the regulatory requirements be any different for an IFC service provider to offer IFC services in Indian airspace in airlines registered outside India vis-à-vis those if IFC services are provided in Indian registered airlines?

Article 18 of the International Radio Regulations requires any operator of a radio transmitter to secure an authorization from the administration to which it is subject prior to operation. This requirement is reflected in *recommends* 1 of Rec. ITU-R M.1643, which notes that the Recommendation "be used by administrations as a guideline…to facilitate AES operations" and in Resolutions 156 (WRC-15) which makes specific reference to Art. 18.

With that said, it is important that the authorization regime for foreign airlines reflect the limited amount of time spent in Indian airspace and the regulatory regime adopted by other administrations. Therefore, IFC service providers to airlines registered outside India, when providing service over Indian airspace, should have different regulations appropriate for that segment.

ViaSat recommends a simple online process whereby IFC providers for airlines can register with the DOT, for providing IFC services in Indian airspace. They can be requested to certify compliance with the rules and standards proposed under Question 2 and 4, and submit relevant technical information on their operation to show compliance. This information can include:

1. Self certification of conformity with relevant standards required by TRAI (i.e. ETSI EN 303 978)
2. Frequencies used
3. Name and orbital location of satellite used to provide service in India
4. Self certification that operations in Indian airspace will comply with relevant ITU rules required by TRAI (e.g. Recommendation M.1643 or Resolution 156 (WRC-15).

Q.12 Do you agree that the permission for the provision of IFC services can be given by making rules under Section 4 of Indian Telegraph Act, 1885?

Yes

Q.13 Which of the options discussed in Para 3.19 to 3.22 should be mandated to ensure control over the usage on IFC when the aircraft is in Indian airspace?

As satellite telecommunications technology has evolved, the traditional hub and spoke architecture of satellite networks has evolved also. New High Throughput Satellite systems are not capable of simply placing a gateway Earth station in a country to satisfy lawful intercept requirements. These satellites have dedicated feeder link beams with large numbers of gateway Earth stations located in areas chosen for optimized system design, rain diversity, and low-cost connectivity with the terrestrial backbone. Lawful Intercept requirements of the Government of India can be accomplished transparently and easily, without requiring gateway Earth stations to be present in the country.

The TRAI is right to distinguish between domestic and international flights. For the technical reasons stated above and recognizing the complexity of business agreements for an international flight which traverses multiple countries, the solution identified in Section 3.21 suggesting backhaul or mirroring of traffic when an international flight (on an Indian registered airline or a foreign registered airline) is in Indian airspace, to a node in India is the solution recommended. Any other solution that mandates the use of an Indian satellite system or foreign satellite leased through DOS, or mandates a connection to Ground Earth Stations in India would be highly restrictive to IFC providers on international flights.

For domestic flights, ViaSat recommends that TRAI also allow direct use of foreign satellite systems, without having to be leased through DOS (see answer to Q.14 and Q.15). Therefore, the solution provided in Section 3.21 is also recommended for domestic flights which use foreign satellite systems.

Q.14 Should the IFC operations in the domestic flights be permitted only through INSAT system (including foreign satellite system leased through DOS)?

IFC providers should be able to select and work with satellite providers directly, to enable them to provide the best service in this competitive market. Satellite technology, like in ViaSat's satellites is evolving very quickly and is able to provide broadband in the air, that is comparable with broadband on the ground, and provides a competitive edge. ViaSat does not recommend that IFC operations for domestic flights be constrained to use the INSAT system or require leasing foreign satellite capacity only through DOS.

Q.15 Should the IFC operations in international flights (both Indian registered as well as foreign airlines) flying over multiple jurisdictions be permitted to use either INSAT System or foreign satellite system in Indian airspace?

ViaSat recommends that TRAI not mandate use of a particular system and allow direct access to foreign satellite systems for IFC operations in Indian airspace for all international and domestic flights on Indian and foreign registered airlines, for the reasons stated in the answer to Q.14.

Q.16 Please suggest how the IFC service providers be charged in the following cases?
(a) Foreign registered airlines.
(b) Indian registered airlines.

The market of IFC is in its infancy in India for both domestic and international flights. In order to spur this market, the solution envisaged by TRAI to use the existing Unified License regime and a light touch based on a token amount for the IFC provider is an appropriate one. Please see our response to Q.8.

Q.17 Should satellite frequency spectrum bands be specified for the provisioning of the IFC services or spectrum neutral approach be adopted?

Because IFC services are provided over satellite networks that share frequencies with other services, as well as share with other satellite services, they should only operate in frequency bands that have been approved for their use at the ITU level. Within those broad parameters defined by the ITU, however, a spectrum neutral approach should be adopted.

Q.18 If stakeholders are of the view that IFC services be permitted only in specified satellite frequency bands, which frequency spectrum bands should be specified for this purpose?

See answer above.