

## **INMARSAT'S REPLY TO THE ISSUES RAISED IN THE TRAI CONSULTATION PAPER 14/2017 on IFC**

### **Introduction**

Inmarsat is most appreciative of this TRAI consultation on the important topic of In Flight Connectivity (IFC) for India and is very pleased to reply.

Air Transport in India is vital to economic growth. According to the International Air Traffic Association (IATA), for the past three years India's airline passenger traffic has increased significantly. Indian airlines are adding capacity, responding to the Government of India's efforts to expand services and economic growth to more cities. A highly competitive aviation market has developed which is offering passengers lower fares, further increasing the demand for travel.

Inmarsat is a long established and trusted global provider of mobile connectivity, including IFC to airline passengers and aeronautical safety and security services, thus benefiting passengers as well as the crew.

Using its L-band satellites, Inmarsat has been providing connectivity to the airline industry for many years. Inmarsat aeronautical safety and security systems (e.g. cockpit communication, flight tracking) are installed on thousands of aircraft, corresponding to about 95% of the world's long haul airliner fleets. GX Aviation, which uses Inmarsat latest generation of satellites in Ka-band, is the world's first and only global high-speed broadband service from a single provider. GX offers passengers the same fast and reliable connection from an aircraft that they could previously enjoy only while on the ground.

Inmarsat is also transforming the airborne communications market in Europe with an integrated satellite and air-to-ground system using S-band, the so-called European Aviation Network.

Based on this unparalleled experience, Inmarsat is convinced that the introduction of IFC on board Indian registered aircraft will create a compelling offering for the growing number of airline passengers in India.

The benefits will be broad ranged, incorporating capability on both short and long-haul flights, where passengers will benefit from broadband connectivity with airborne access to on-line services, whether for business or leisure.

More than fifty of the world's airlines already offer IFC today, while operating flights covering most of the globe. The expected new IFC policy for India will bring this advanced capability to aircraft and their passengers, while operating in Indian Airspace, and is expected to improve the competitive offering of Indian airlines operating international flight.

**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**

Inmarsat Response:

High data rate Internet IFC services, such as the one provided with Inmarsat Global Xpress in Ka-band, are becoming widespread and an imperative for Airlines to maintain competitiveness. Inmarsat therefore strongly encourages introduction of IFC Internet services in India.

Inmarsat also suggests for MCA services to be at least permitted for foreign airlines when traversing the Indian airspace, as they have already been globally provided for several years. SITAONAIR, for example, has been providing MCA services, together with Internet services, to a large number of major airlines using the capacity of the Inmarsat-4 satellite series operating in L-band.

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

Inmarsat Response:

Yes, Inmarsat believes that global standards should be mandated. Due to the cross-border nature of air transport and related IFC services, it is fundamental that internationally recognised and harmonised standards are adopted. The content of Table 2.1 is widely accepted and contains the essential technical and operational conditions for the operation of these types of terminals, including spectrum sharing aspects with other systems operating on the same frequency band. In relation to L-band systems, there also are widely recognized standards such as ECC Decision (12)01, ITU RESOLUTION 222 (Rev .WRC 12), ETSI EN 301 473.

**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?**

Inmarsat Response:

Technical guidance in EC Decision 2008/294/EC, Commission Implementing Decision 2013/654/EU (as amended by Decision 2016/2317/EU) and ECC/DEC(06)07 should be considered. The technical conditions therein contained have been successfully implemented and accordingly operated over a number of years without any emerging reason for concern about such interference.

**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?**

Inmarsat Response:

Inmarsat does not foresee any challenge from a technical, operational and regulatory perspective, arising from IFC Internet services provided on aircraft from "gate to gate". On the contrary, airlines are now routinely requesting gate-to-gate operation as an integral part of the onboard internet service provision requirement. As also highlighted in TRAI's consultation paper, the 3000m minimum altitude limit was introduced specifically for avoiding potential for interference from MCA into terrestrial mobile cellular networks. As such this altitude limit is not relevant for Wi-Fi Internet provision onboard, which makes use of a different device technology. This was further supported when leading Aviation Safety Regulators, as a result of the unabated growth in use of Portable Electronic Devices (PEDs), such as mobile phones, tablets and laptops have re-assessed their policies on PED use on board commercial aircraft. Following the issuance of new guidance, both the Federal Aviation Administration (InFO 13010) and European Aviation Safety Agency (SIB No: 2013-21) now permit the use of PEDs operating via WiFi during all phases of flight. The operation of Inmarsat Global Xpress aeronautical terminals is already authorised for gate-to-gate operation in a number of countries and the airports where our airline customers are operating.

In the European Union, restrictions regarding the protection of aircraft avionics from electromagnetic fields generated by earth stations in the vicinity of an airfield will soon be lifted due to the work ongoing at ECC Working Group Spectrum Engineering (WG SE). ECC liaised with aviation experts and confirmed that the aircraft protection criteria used to calculate the restrictions in ECC Decisions is incorrect and has prepared a new report (ECC Report 272) on this issue. The revised calculations indicate that aircraft earth stations operating in both Ku and Ka-band can be operated within and in the vicinity of airfields

without any restrictions related to aeronautical safety. ECC Report 272 has been sent for public consultation, which will close on 28.11.2017. Based on the ECC Report 272, restrictions on earth station operation within and near airfields would be removed from ECC Decisions for both Ku and Ka band.

In fact, Inmarsat has conducted its own technical interference assessment and came to the same conclusion.

Regarding potential impact on licensing and competition, we believe the service is not competing with licensed services on the ground, especially onboard foreign aircraft where connectivity within the aircraft is confined to the passengers in the cabin and is indeed not addressed to the population at large.

Finally, in relation to possible concerns such as IFC distracting passengers during the security briefing at take-off, this may be easily taken care of by interrupting the connectivity during the announcements, as it is now the case for In Flight Entertainment. It is also worth noting that passengers on most airlines can already access the content (e.g. music, video) of their personal devices (e.g. mobile phone), as long as in flight mode, during take-off and landing.

**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?**

Inmarsat Response:

While duly licensed operators in India may be permitted to offer IFC services, Inmarsat is of the opinion that Unified license should not be considered as a necessary condition to offer IFC as a number of requirements therein contained would likely constitute a regulatory burden hindering a rapid and successful adoption of IFC services in the Indian airspace.

It is important that India introduces an authorization process that is simple and not cumbersome, as in the overwhelming majority of countries that have adopted IFC services. As far as access to spectrum is concerned, it is of great importance to bear in mind that assignment via spectrum auction would not lead to an appropriate and efficient use of this scarce resource in Ku and Ka-band. In fact, thanks also to the directivity of the terminals in these frequency bands, spectrum can be shared between multiple satellite operators providing similar services.

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

Inmarsat Response:

Yes, in line with the above, we believe that a separate category of IFC Service Provider may be created to permit IFC services in Indian airspace for aircraft registered in India. This would permit the adoption of regulatory requirements that are relevant and adapted to the nature of IFC services and ecosystem.

An upcoming revision of the National Telecom Policy (possibly planned for 2018) may be an opportunity to introduce a new category, in consultation with the relevant industry players. In the meantime, agreements with duly licensed Indian operators may be a possible way forward to introduce IFC services in the domestic Indian airline market.

**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?**

Inmarsat Response:

Yes, Inmarsat believes that entering into an agreement with a duly licensed operator in India should allow an IFC service provider to provide IFC services in Indian airspace to aircraft registered in India. With such agreement, the roles would be complementary while guaranteeing a local presence. Both parties would use their own infrastructure and operational/commercial expertise for ensuring best experience to the customers at the lowest price.

**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?**

Inmarsat Response:

In flight internet services are set to quickly become mainstream due to high customer demand and ongoing deployment. Customers will soon have the same expectation of Wi-Fi on board an airplane as they do on the ground. Inmarsat believes simplicity of requirements to be of the utmost importance to assure a timely and cost-efficient provision of the services once the rules are in place. As such, minimizing the number of requirements is advisable. If permission is granted under a partnership with a duly licensed operator, there is no obvious need for the licensee to provide further notifications of its partner supplier. Also, while this market segment is highly competitive, there are only a handful of suppliers.

**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?**

Inmarsat Response:

For the case of IFC/Internet, a duly licensed operator with the equivalent of an Internet Service Provision authorisation could be permitted to tie up with an IFC Service Provider.

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

Inmarsat Response:

Inmarsat does not see any need for any additional restrictions or regulations, keeping in mind the overall interest of the passenger.

**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?**

Inmarsat Response:

Authorisation for IFC provision on foreign registered aircraft while in Indian airspace (i.e. foreign visiting aircraft) is a fundamental aspect to allow global operations, which is an inherent characteristic of this type of service provision. When considering IFC provision to foreign based airlines, it is paramount to consider the principle of reciprocity.

Indian registered airlines operating international flights and using other countries airspace, are expected to require equivalent capability and continuity of service. Foreign airlines, while in Indian air space, should have the same rights to provide IFC services to their passengers. If restrictions are imposed, this could lead to lack of reciprocity in the airspace of other countries.

International aviation depends on the principles of reciprocity. Note that the concept of reciprocity as mentioned in the consultation paper (i.e. “the granting of a right or benefit by a State to a foreign airline when it has no international obligation to do so, on the condition that the same treatment will be accorded to its airline by the home State of that airline”) is well known in the civil aviation industry and stems from the Convention on International Civil Aviation 1944 (The Chicago Convention). This is further supported by **Article 33** of the Chicago Convention (“Recognition of Certificates and Licences”) which states “certificates of airworthiness and certificates of competency and licenses issued or

rendered valid by the contracting State in which the aircraft is registered, shall be recognized as valid by the other contracting States.”

The authorisation for IFC provision on foreign aircraft while overflying a foreign country is already widely implemented. The principle of free circulation for foreign visiting terminals is routinely either:

- embedded in the country national regulations (e.g. Australia, New Zealand, UK and others) or
- based on multi-country agreement (for Ka-band, see for instance ECC/DEC(13)01) or
- bilaterally agreed between the Regulator and the satellite/service provider, often on the basis of simple non objection, as long as terminals are duly authorised by the country of registration and do not cause any interference to other domestic systems operating in the same frequency bands

In summary, foreign registered airlines should expect to be treated while in Indian airspace, similarly to the established policies applied internationally. This would include the option to access IFC via non-Indian satellites, especially if these satellites can provide global/international coverage.

In terms of security requirements, there are various options to meet the information requirements on the traffic reporting that must be provided to the authorities. This includes an in-country gateway, which is not always a straightforward solution in relation to foreign airlines because of the network configuration of the satellite provider. Alternative solutions, including so-called virtual gateways or mirror copy of traffic, could also be considered, at least on an ad-interim basis. This has already been selected as a viable alternative and effective security solution for in-country gateway functions elsewhere.

**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?**

Inmarsat Response:

Yes, Inmarsat agrees.

**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?**

Inmarsat Response:

It is clear that both security requirements and the Indian Space Policy need to be fully addressed for both domestic and foreign airlines. It is nevertheless important to continue to draw a reasonable distinction between the two cases.

Inmarsat is of the view that alternative options along the lines described in Para 3.21 may be best for the introduction of IFC services on foreign airlines.

It is important to retain a degree of flexibility also for domestic airlines. While the deployment of a gateway, as outlined in Para 3.20, may provide the stable, long term solution, the possibility of alternative options (e.g. those in Para. 3.21) should also be considered, at least on an ad-interim basis, to allow for prompt deployment with the most appropriate IFC technology to fit the Airline needs.

As far as Para 3.19 and 3.22 are concerned, it is clearly essential, given the intrinsic international nature of the service, that the option of flexibly using foreign satellites is retained.

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

Inmarsat Response:

This distinction would not work efficiently in practice, as, quite often, the same aircraft can be used on both domestic and international routes, depending on airline and operational needs. Airlines require that their aircraft are internationally interoperable. Imposing limitations to domestic flights would have the effect of reducing the numbers of aircraft able to use other options internationally, as Airlines limit investments to equipment that has global usability.

**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?**

Inmarsat Response:

IFC service provision on international flights is across multiple countries and continents. Foreign satellite systems, especially when providing seamless global coverage, are ideally suited and should be permitted to be used. Enforcing use of INSAT systems on international flights has the potential to condition use of frequencies and technology, which is not expected to benefit Indian customers. In summary, IFC services on international flights, both on Indian registered and foreign airlines flying over multiple jurisdictions, should be permitted to use any suitable satellite system which caters to the technical and commercial needs of airlines for IFC service provision.



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

(a) Due to the principle of reciprocity and the common policy on this issue in other countries, foreign airlines should not be charged for IFC service provision, also as they are already regulated under the jurisdiction of the country of registration.

(b) Due to the proposed authorisation under a duly authorized domestic service provider, associated fees will already be paid accordingly, based also on the commercial arrangement between the IFC provider and the licensee. Further to this, it necessary not to forget that, in order to make the service commercially viable, any additional fee/expense will ultimately be passed on by the airlines to the customers (e.g. reflected in the service price), to the detriment of the associated benefit. Also, revenue based fee calculation may not be straightforward, as some airlines may decide, for instance, to include basic connectivity already in the price of the ticket.

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

Inmarsat Response:

Inmarsat believes that, similarly to the terrestrial mobile industry, provision of IFC services should be addressed on a spectrum and technology neutral basis. For instance, in the context of bands for which there is an internationally agreed regulatory framework for IFC internet services available, limiting the IFC service to a subset of bands will not be the best solution for passengers and airlines, as it will limit the choice by creating unnecessary regulatory limitations. Operators should be left free to consider which bands and technologies best suit their needs in order to deliver connectivity services in the most efficient and productive manner.

Finally, it is necessary to keep an open mind for the future. As an example and also as pointed out in the consultation paper, under A.I. 1.5 of WRC-19, possible technical and operational conditions for use of ESIM in the 17.7-19.7 and 27.5-29.5GHz bands are also under assessment. Satellite technologies are evolving rapidly with new approaches revolutionising the industry in frequency bands such as Ka and S band, but extending also to future bands for satellite services evolution, such as Q and V bands. This is one more reason to adopt a principle of a spectrum neutrality in the policy.

**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?**

Inmarsat Response:

Not Applicable.