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Via Email - advmn@traf.gov.in

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India

Subject: Gogo response to TRAI Consultation Paper 14/2017 on In Flight Connectivity (IFC)

Dear Shri Abbas,

Gogo wishes to thank the Telecommunications Regulatory Authority of India (TRAI) for its commitment to regulatory development in the In Flight Connectivity (IFC) space and its forward-looking digital policies in line with the Prime Minister's *Digital India* vision.

Gogo is the leading global provider of broadband connectivity products and services for the aviation sector. Our products and services can be found on over 7700 aircraft operated by the leading global commercial airlines and private aircraft operators. Gogo's global Ku-band satellite network, architected with capacity provided by leading satellite operators, provides seamless IFC coverage for passengers around the globe while meeting the diverse requirements of nearly 200 regulatory authorities.

Gogo agrees fully with the assessment that global demand for IFC is soaring. The formalization of a coherent regulatory framework in the near term based upon existing components of Indian telecoms regulation and international best practices will ensure that the Indian market for IFC will generate value for all stakeholders in the near term, especially Indian travelers and companies who have thus far been unable to benefit from participating in this domain. We look forward to contributing to the development of the Indian IFC services market and enabling the connected traveler in India.

Yours sincerely,

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Attachment.

Response to TRAI's Consultation Paper 14/2017 on In Flight Connectivity (IFC)

Summary

Responses are meant to be consistent with several fundamental principles with the expectation that a regulatory approach based on these will best favour the interests of all stakeholders. Overall, Gogo recommends:

1. A regulatory approach based upon fundamental ITU and ICAO principles separately establishing potentially robust licensing requirements for national aircraft from those applied to visiting aircraft domiciled abroad that are already licensed by and well regulated by their home authorities;
2. A regulatory approach that allows for the coherent and cost-effective solutions leveraging both Indian and international assets to enable timely deployment of IFC network resources;
3. A near-term focus on establishing the regulatory framework for Wifi/Internet IFC services and deferring MCA considerations to a later stage so as to facilitate near term developments providing the most benefit to the travelling public soonest;
4. Ensuring that regulations do not impede the operation of Wifi/Internet IFC systems during all phases of flight from "gate-to-gate".

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

Gogo recommends focussing on concluding the regulatory framework for inflight Internet services based only on Wifi access points in the aircraft over the short term as this will have the greatest public benefit in a relatively short period of time. Additionally, the regulatory framework for onboard Wifi/Internet services in other markets is typically more uniform and mature than that for MCA which must consider potential interference with mobile network operators and protecting the exclusive rights of those operators.

While offering some potential benefit to a small number of passengers the regulatory framework for MCA would be much more involved and would require the inclusion of many more stakeholders such as the spectrum rights holders in India. Once the regulatory framework for Wifi/Internet services is implemented, a re-assessment could be made for the consideration of a regulatory framework for MCA.

The market demand for inflight Wifi/Internet services far exceeds that for MCA and many more aircraft operating in and over the Indian airspace are currently, and expected to become, equipped with Wifi/Internet systems versus those equipped with MCA systems.

For the balance of our response we will address only matters related to inflight Wifi/Internet services.

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

For the purposes of Ku-band satellites, the cited documents provide an excellent foundation for any Indian standards and have provided a well-established framework for the regulation and operation of AMSS for more than a decade and have been adopted by scores of telecommunications regulatory authorities in all regions of the world. Many countries simply refer to or cite those documents as a matter of regulatory policy.

ITU-R M.1643 provides the fundamental and essential requirements for the performance of Ku-band Air Earth Stations (AESes). Often countries only require compliance with M.1643 as the basis of authorization for the operation of Ku-band AESes.

EN 302 186 is effectively derived from M.1643 and establishes a framework and technical standards to which AESes may be operated in the EU. Many regulatory authorities outside of the EU simply refer to compliance with EN 302 186 as the basis for radio type approvals or homologation of AESes for use on national airlines.

Decision ECC/DEC/(05)11 allows for the free circulation and use of Ku-band AESes throughout the EU and CEPT countries and establishes the conditions for doing so. Many regulatory bodies also reference this document or borrow the same principles for national regulation.

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?

Gogo recommends that these considerations be studied when the matter for introduction of MCA is assessed after introduction of a regulatory framework for inflight Wifi/Internet has been well established.

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?

There are no technical nor necessary regulatory challenges with permitting a "gate to gate" IFC service using qualified Ku-band AESes and in-cabin Wifi systems in India

The safe operation of IFC service has been proven by multiple airlines who have carried out safety checks designed by their national or regional civil aviation authorities according to strict specifications. Operation on the ground is now permitted by telecommunications and aviation safety regulators for qualified Ku-band AESes in such countries as the United States, Japan, Australia, United Kingdom, Spain, Germany, Brazil, and many others. Other countries are in the process of approving "gate to gate" operations and the latest version of ECC Decision (05)11 as amended in March 2015, which includes provisions for "gate to gate" operations, is being implemented by regulatory bodies across Europe.

From a technical perspective, there is no impact of offering the service on the ground or at any flight level. ITU recommendation ITU-R M.1643 (defining technical and operational characteristics of aircraft earth stations) imposed no altitude limits on the operation of the AES. The United States FAA, the European Aviation Safety Authority (EASA), and the International Air Transport Association (IATA) and now multiple national civil aviation bodies have issued guidance to airlines indicating how they demonstrate procedures for the safe operation of systems used in "all phases of flight" (gate-to-gate). It is now well accepted that systems can be operated safely any flight level, including on the ground and at the gate.

In cooperating with industry members including Gogo, the European Conference of Postal and Telecommunications Administrations (CEPT) Electronic Communications Committee (ECC) has drafted Report 272 entitled "*Earth Stations operated in the frequency bands 4-6 GHz, 12-18 GHz and 18-40 GHz in the vicinity of Aircraft*"¹. This report, currently available for public consultation, "confirms that there will be no impact to aeronautical safety due to the operation of earth stations with e.i.r.p. levels [below specific thresholds]" and that "No restrictions on the proximity to or operation within

¹ <https://cept.org/ecc/tools-and-services/ecc-consultation>

airfields are required for earth stations complying with these e.i.r.p. limits.” Ku-band AESes typically operate at a power level below 50dBW e.i.r.p. with is well within the limits identified in Report 272.

By way of history, until late 2013 there was a global prohibition on the use of passenger electronic devices below 10'000 feet, however in the later part of that year the US FAA, followed by the EASA and other countries' aviation safety and regulatory bodies established rules which permitted airlines to authorize the operation of PEDs and transmitting PEDs (TPEDs) during all flight phases “from gate to gate”.

“Gate to gate” operation important in providing the passenger an uninterrupted essential service during the entire journey thus significantly improving the overall travel experience. Additionally, because IFC service is also used for non-safety operational communications between the aircraft, airport authorities and airlines, permitting systems to remain active on the ground also allows for important airline data and aircraft operational metrics to be communicated at any time.

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?

Gogo recommends that the existing Indian regulatory framework, including the Unified License structure and provisions, be leveraged to effectively authorize the provision of IFC services on airlines/aircraft registered in India. This approach enables

- Use of existing regulatory assets with well-known policies and practices without the need to create new standards that are meant to accomplish the same objective;
- An approach consistent with both ICAO and ITU standards where the “home country” of an operator assumes primary regulatory jurisdiction over operation of relevant communication systems.

We acknowledge that minor modifications to the license applications and eventual license documents may be required to accommodate aspects of mobility.

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

Components of the existing Indian regulatory framework, including the UL, VSAT license and Internet service authorization already appear to be sufficient and no new category, *per se*, should need to be created. Some additions or modifications to the documentation required to, for example, register a VSAT (AES) terminal may need to be modified as an AES, by definition, does not have a fixed location but rather a fixed positioning on a specific aircraft which is easily identifiable.

While it would be most efficient to leverage existing regulatory resources and the expertise of existing VSAT operators and CAT-A ISP's, there may be merits in considering creation of a separate “IFC Service Provider” category in due course.

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. In our experience, the type of cross border supply of service as contemplated in the question and accompanying text is quite common around the world.

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?

In our experience elsewhere around the world, and based on the scenario contemplated here, there has been no need for separate permission or registration to be taken by IFC service providers from the national regulatory body so long as there is a domestic company who already holds the necessary licenses and takes regulatory responsibility for the relevant technical and business operations of those systems and the communications services offered.

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?

A Unified Licensee holding a VSAT license and Internet service authorization (ISP Cat-A) should be permitted to engage with an international IFC service provider to offer IFC services on Indian airlines.

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

No other restrictions or regulations need to be in place for the provision of IFC onboard airlines registered in India. This presumes that existing Indian regulatory frameworks adequately protect the rights of all Indian stakeholders including spectrum users, consumers and aircraft operators and ensure that the safety and security of network and related services is maintained.

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?

Both in the international aviation community (overseen by ICAO) and in the global telecommunications community (overseen by the ITU) the country in which a system/device is typically based exercises the primary regulatory responsibility over that system/device. This is the basic principle on which global aviation and mobile telecommunications is built and is fundamental to both the ICAO Chicago Convention (specifically Article 30) and the ITU Radio Regulations (specifically Article 18 which addresses licensing matters).

Based on these principles, Gogo feels strongly that an approach maximizing opportunities of reciprocity between Indian stakeholders and their counterparts in other countries would best serve the IFC market due to reduced friction and other potential restrictions. IFC services onboard Indian aircraft would be treated with the same consideration when travelling abroad as aircraft from foreign nations may receive while in India.

Very specifically, countries sometimes apply common spectrum or terminal licensing conditions for the operation of AESes independent of the aircraft on which it is operating, but seldom, if ever, seek to impose service licensing and compliance requirements related to the IFC services rendered on-board aircraft from another sovereign nation.

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?

The degree of lawful interception and monitoring of communications within the Indian jurisdiction may vary according to the nationality of the aircraft operator and may be accomplished through various technical means.

As indicated in the response to Q.11, the primary regulatory and legal responsibility of aircraft and communications systems lies within the country in which those systems are based. Typically we have seen that greater control over the of domestic aircraft IFC system/service security may be required versus the security measures imposed upon IFC systems/services on foreign airlines which may only occasionally pass over India. This is typically based on the principle of proportionality and the practicalities of imposing robust security controls on the occasional visiting aircraft versus the more intense and frequent use of the same service in India by an Indian airline.

From a purely operational and technical perspective, to meet the requirements for lawful interception and monitoring in India it would not strictly be required to use space segment leased through DOS, nor would it be required to use an Indian teleport to access the space segment an IFC service provider may be able to use over India. The concept of a “virtual teleport” or “mirror copy gateway” may be employed to allow for foreign teleports to forward Indian jurisdiction traffic to an Indian Cat-A ISP for the purposes of Indian network control and security purposes, especially for the purpose of enabling IFC services on foreign airlines. As all Indian traffic would pass through the Indian virtual teleport, security authorities maintain an absolute control over disabling inflight passenger communications in real time. The virtual teleport approach would almost certainly accelerate the deployment of IFC in India for the benefit of all stakeholders without impacting the rights of any.

IFC network elements are typically configured to deterministically use specific network resources depending on the geographic position of the aircraft at any point in time. This application of “geofencing” currently used to drive handovers between satellites, satellite subnetworks and spot beams could be used to create a virtual “India satellite subnetwork”, potentially within a larger satellite beam, in which all of the Indian jurisdiction requirements would be met including the routing of all traffic through an Indian Cat-A ISP.

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

Typically markets with fewer access restrictions provide greater buyer choice leading to lower prices, improved performance and greater opportunities for innovation. We respect that the current regulatory framework in India appears only to support satcoms services via capacity leased through the INSAT system. However, Gogo would welcome regulation allowing IFC providers, including Indian companies, to gain unfettered access to additional space segment capacity that is already in place over India as well as that current planned for deployment and any future capacity to be deployed so long as all relevant international technical standards and conditions of coordination agreements are met.

At present it appears that there may not be sufficient and adequate available space segment resources in the INSAT system nor sufficient and adequate ground segment (teleport) resources available in India. Allowing for the use of foreign satcoms resources would help drive innovation, performance and increased supply within the Indian domestic market.

Satellite operators are in the best position to determine what uses should be applied to their satellite capacity. We recommend that IFC providers and satellite operators should be free to collaboratively adjust their spectrum requirements based on satellite transponder availability and spectrum availability.

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?

We agree that IFC operations on Indian registered and foreign air operators' international flights may be permitted to use any available space segment capacity that may be available both inside and outside of Indian airspace so long as use of that space segment is consistent with to international technical standards.

Q.16 Please suggest how the IFC service providers be charged in the following cases?

(a) Foreign registered airlines.

(b) Indian registered airlines.

Gogo has found that reducing additional IFC-specific taxes and fees generally reduces complexity and other barriers to market growth. Our experience is that IFC-specific government-imposed fees are either negligible or non-existent in most countries, at least for services provided only to foreign air operators operating in India on the basis of free passage.

Based on experiences in other markets and recognizing the existing fee collection frameworks in India, there are several ways revenues may be collected by State agencies:

- The sale of or taxes and fees placed upon space segment resources contracted through the DOS by an IFC service provider.
- Taxes and fees calculated on the intermediate services (e.g., teleport rental, network capacity) rendered by Indian companies.
- Value added taxes and/or goods and services taxes applied to transactions occurring in India, including for the supply of intermediate services (e.g., teleport services) and end user services (e.g., as may be applied to sales to passengers on board)
- Nominal fixed/flat fees assessed upon the Cat-A ISP license holder for the provision of IFC services.
- Spectrum license fees, either fixed or as a function of space segment allocated, e.g., measured in MHz.
- Annual service provider fees assessed as a proportion of sales within a particular country (e.g., 0.0861% on revenues of greater than 5MGBP in the UK).

Apportioning revenues collected from international passengers to various countries is simply not practical and we have seen no instances anywhere in the world of fee assessments based on the proportion of a given flight that may be in or over a given country. In some cases, VAT assessments are made based on the origin of the flight so that the VAT collected on sales of electronic communications at any time during that flight are assessed in the country from which that particular flight segment originated. In other cases, particularly within the EU, VAT may be applied for the IFC service according to the country in which the end user is resident, while in other cases VAT may be assessed according to the flag state of the air operator or aircraft.

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

The market is best served by an overall approach that is neither spectrum band specific nor technology specific (e.g., GSO vs NGO) in the context of IFC services so long as use of the spectrum

allocated for mobile satellite services (MSS) is used according to both international and national regulations (e.g, the Indian NFAP) and that systems are operated according to the accepted technical norms.

It appears that, pending minor modifications already in progress (e.g., to the Indian NFAP), Ku-band MSS services may be licensed and operated within the existing Indian regulatory framework.

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?

So long as there is an adequate spectrum allocation and satellite spectrum use regulatory and access framework in India for a given frequency band, such as that which is already in place for the Ku-band, that same band may also be made available for IFC type services.