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**Re: Response to Consultation Paper on In Flight Connectivity (IFC)
dated 29th September 2017**

Panasonic Avionics Corporation (Panasonic Avionics) appreciates the efforts of the Telecommunications Regulatory Authority of India (TRAI) to formally open the Indian market for in-flight connectivity (IFC) services. Panasonic Avionics and its implementation partners support IFC operations globally. In addition, we are working with Indian airlines to bring the benefits of IFC to the India market.

India would be well-served by an IFC regulatory regime that minimizes the costs and complexity of IFC operations in India and maximizes the flexibility and competitiveness of IFC offerings onboard Indian airlines. TRAI should consider an approach that authorizes Indian airlines to implement any IFC system onboard their aircraft, subject to compliance with rules designed to prevent interference and satisfy other important national policy concerns. In this way, Indian airlines will be able to implement IFC solutions that best meet their needs from any vendor that can satisfy the applicable rules.

With respect to IFC onboard foreign aircraft, TRAI should consider an approach that recognizes IFC licensing undertaken by an aircraft's registering nation rather than "relicensing" these operations. Such an approach would be consistent with prevailing trends in IFC licensing, provide vendor flexibility to foreign airlines like that contemplated for Indian airlines, and help ensure that foreign countries do not implement duplicative and burdensome IFC licensing requirements that may be applied to Indian airlines operating abroad.

Again, Panasonic Avionics appreciates TRAI's efforts with respect to IFC operations within India and looks forward to expeditious adoption of regulations that will facilitate the introduction of IFC services for Indian airlines. We look forward to the opportunity to engage further on these issues at the appropriate time.

Respectfully submitted,



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Attachment

Panasonic Avionics Corporation Comments and Responses to IFC Consultation Questions

Panasonic Avionics provides its general comments and responses to the specific questions in the IFC Consultation Paper below.

Panasonic Avionics Background. For nearly a century, the Matsushita name has been synonymous with superb manufacturing quality. Matsushita began its expansion into the field of avionics in 1979, quickly establishing itself as a market leader by being one of the first companies to market video equipment and offer passenger control units to the airline industry. Matsushita Avionics Systems Corporation was established in 1979 as a wholly-owned subsidiary to the Panasonic Corporation, and in 2005 became Panasonic Avionics Corporation. Today, we are the world's leading supplier of in-flight entertainment and communications (IFEC) solutions (for consistency referred to herein as "IFC").

Panasonic Avionics seeks to strengthen the connection between the world's leading airlines and their passengers. In partnership with our airline customers, we design and implement breakthrough IFC solutions that engage and delight passengers. These solutions are more than just hardware and applications – they are total solutions that leverage our systems and software, Global Communications Services (GCS), and Panasonic Technical Services to generate more value for an airline's business.

Operating the world's largest IFC network, Panasonic Avionics uses broadband connectivity to link an aircraft's entertainment system and operations to the airline's marketing and maintenance organizations. Our global network and turnkey support organization deliver proactive maintenance and repair services that ensure maximum system reliability, availability, and performance. Panasonic Avionics delivers more than IFC systems — we deliver airline business solutions.

Panasonic Avionics provides its input on the questions raised in the Consultation Paper based on years of experience in providing IFC globally, and as an IFC provider that is committed to offering IFC on Indian airlines as efficiently and effectively as possible. We respectfully offer the following suggestions for TRAI's consideration in developing an appropriate regulatory regime for IFC services in India.

- *IFC Operations Are Unique* – In some ways, the IFC Consultation Paper suggests that regulating IFC offerings (i.e., operation of IFC network and terminals) may require approaches similar to other consumer services in the national market. However, IFC is unlike traditional telecoms because (i) IFC is offered by an airline to a closed user group of passengers as an in-flight amenity; (ii) IFC equipment is licensed by the home nation of each airline; (iii) IFC is inherently international because it relies on a unique satellite-based infrastructure optimized for global operations; and (iv) for

the sake of efficiency, airlines must access the same network to provide IFC services across large geographic areas. Adopting rules that effectively establish a separate Indian domestic IFC market or impose burdensome requirements on IFC operations may undermine the ability of all airlines to offer IFC to their passengers.

- *Limit Regulation for Niche IFC Service* – IFC services are offered within the aircraft cabin as a passenger amenity subject to the regulatory authority of an airline’s registering nation. Because IFC is offered to a very small number of potential users in a controlled environment, it is typically subject to very “light touch” regulation. To the extent possible, TRAI should also seek to minimize regulatory requirements applicable to IFC onboard Indian airlines. IFC may not require extensive telecom regulation because it is not offered generally to consumers in the Indian national market.
- *Regulate Consistent with International Approaches* – The prevailing international approach to IFC regulation includes two fundamental elements: (i) recognition of foreign aircraft licensing for IFC equipment operations; and (ii) regulation of service within the aircraft cabin by an airline’s home nation. IFC radio operations must be consistent with the regulations of the overflown country but they need not be “re-licensed” by an overflown state. (For example: Europe allows for free circulation of Ku-band IFC terminals; Brazil exempts radio equipment on foreign aircraft from licensing as they operate on a non-interference basis; and Australia has adopted a general authorization for Ku-band aircraft terminals.) An airline’s home nation is also responsible for the service offered onboard the aircraft. It may be difficult for Indian airline passengers to enjoy the full benefits of IFC if TRAI adopts more costly or complicated approaches.
- *Don’t Disadvantage Indian Airlines* – TRAI is free to establish regulations for IFC onboard Indian airlines – and for IFC equipment operations onboard foreign airlines – consistent with its policy mandates. However, any IFC regulatory regime should treat both Indian and foreign airlines with the same “light-touch.” Indian airlines should not be burdened with complex and potentially costly requirements that may render IFC offerings uncompetitive. TRAI should strive to adopt rules that facilitate implementation of IFC in India as efficiently and effectively as possible.
- *Maximize Airline Choice* – Indian airlines may be best served by authorizing the airlines to enable IFC based on their own unique needs. There is no need to require involvement of Indian Unified Licensees (which provide a range of services to the Indian national market but do not offer service on aircraft in flight), although they could develop IFC offering consistent with any regulatory requirements adopted as a result of this consultation. TRAI can evaluate IFC proposals on an airline-by-airline basis to ensure that each airline’s implementation complies with Indian requirements.

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**

c. Internet services and MCA are complementary offerings, aiding passenger and crew safety, satisfaction, and convenience. Internet services provide broadband connectivity to passengers and crew via on-board Wi-Fi connectivity to enhance productivity and entertainment options. MCA service enables connectivity using passenger and crew mobile devices associated with licensed wireless carriers for text, data, and even voice communications as if the user was roaming internationally. Enabling both types of IFC enhances competition and allows airlines to balance customer needs with cost and technical demands.

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

The Table 2.1 standards should provide guidance but should not be mandated because they are not an exclusive list of IFC standards. For example, the U.S. Federal Communications Commission has adopted a comprehensive set of rules governing Ku-band earth stations aboard aircraft (ESAA) operations that are not included in the table. TRAI should allow applicants to demonstrate compliance with accepted international standards or equivalent operational characteristics in their IFC proposals.

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?

Compliance with accepted international standards (e.g., use of a picocell to limit mobile device transmit power and a network control unit (NCU) to prevent mobile devices from attaching to terrestrial base stations) should be sufficient. To the extent a standard has not been adopted for a particular band, applicants should be permitted to demonstrate that operation in an alternative band would not cause interference to terrestrial mobile operations. Importantly, TRAI's regulations should permit creating approaches to MCA that avoid the potential for interference (e.g., Wi-Fi calling).

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?

Panasonic Avionics does not foresee any challenges associated with "gate to gate" Internet services. Wi-Fi is low-power and non-interfering so there is no

potential for interference with airport Wi-Fi systems. In addition, satellite links operate in spectrum that is generally unshared with terrestrial services so there is no added potential for interference from on-ground operations. MCA services are suspended below a specified altitude so “gate-to-gate” does not apply to these IFC services. Of course, once on the ground (for mobile service) and at the gate (for Wi-Fi service), all users access Indian communications providers only.

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?

It is unnecessary to extend the Unified Licensing regime to IFC operations. This licensing regime was adopted for a different set of services (national, mass market offerings) and requiring the participation of a Unified Licensee could potentially put Indian airlines at a competitive disadvantage. A separate IFC license to be held by the airline would achieve necessary policy objectives by affording the airline IFC vendor choice, subject to compliance with IFC rules.

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

Yes, a separate IFC license for Indian airlines is warranted. IFC is a niche, passenger amenity that is fundamentally offered by the airline – albeit through an IFC vendor. A licensing approach focused on defining basic requirements for IFC and held by the airline will allow Indian airlines to choose the IFC vendor that best meets their needs and require this vendor, through contract, to meet the requirements established by TRAI for IFC on Indian airlines.

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?

For the reasons noted above, such an approach would be unnecessary.

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?

N/A

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?

For the reasons noted above, such an approach would be unnecessary.

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

As a general matter, basic consumer protection, data protection, and privacy concerns should be addressed. However, given the limited, niche nature of IFC offerings, there is no basis for IFC tariff regulation. Internet services are an amenity that a passenger can purchase or decline as they choose. MCA services are priced and billed by the user's home carrier as if roaming internationally, so rate regulation is similarly unnecessary.

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?

It is in India's interest to implement "light-touch" regulation of foreign airlines so other countries do not impose heightened regulations on Indian airlines.

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, Indian airlines can be empowered to offer IFC onboard Indian aircraft. In addition, foreign IFC authorizations for IFC on foreign airlines can be recognized as foreign aircraft and ship radio licenses are recognized today.

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?

Panasonic Avionics acknowledges the legitimate security interests of the Government of India and the safety of our customer airline passengers is of the utmost concern. There are numerous IFC providers with varying network architectures and security solution proposals. These solutions should be considered in the context of approving IFC licenses for Indian airlines. With respect to foreign airlines, because the registering nation has jurisdiction over and is responsible for the safety of the aircraft and its passengers, it is reasonable to rely on foreign IFC licensing to address such concerns.

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 optimize their networks for IFC, which could potentially include INSAT capacity. However, requiring IFC providers to use only INSAT capacity would add cost and complexity for IFC onboard Indian airlines that could make the offering non-viable.

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?

Both INSAT and foreign satellites should be permitted. As described above, IFC providers operate global networks that are inherently international. Indian and foreign airlines, along with their IFC provider partners, should be permitted to access satellite capacity that enables flexibility and seamless operations.

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

- (a) Foreign registered airlines.**
- (b) Indian registered airlines.**

IFC service onboard foreign airlines should not be charged because such a requirement may invite other countries to impose charges on IFC onboard Indian airlines flying through their airspace. With respect to Indian airlines, the small size of the IFC market suggests that no special charging regime should be applied. Rather, applying standard tax and regulatory fee policies would provide adequate revenue from IFC turnover on Indian airlines.

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

IFC applicants should be permitted to demonstrate that proposed systems are compatible with other operations in India in recognized IFC bands. In addition, they should be permitted to introduce equipment that operates in new bands subject to demonstrating there is no material potential for interference from the proposed operations.

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 response to Question 17.